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ABSTRACT

This collection of three monographs focuses on the development of computerized student and personnel recordkeeping systems. Descriptions of three different computerized systems are presented. The first monograph describes the efforts of the School of Education at Florida International University to overcome problems related to the management of student data generated by a competency based teacher education program. The system provides for the collection, management, and analysis of performance data as students progress through their programs. Components of the system include: (1) a Student Progress Report System; (2) a Red Flag Report System; (3) a Competency Data Analysis System; and (4) a Program of Studies System. The second paper describes an attempt to collect, sort, and utilize student data generated from a compentency based program at the College of Education at Wayne State University. The program includes a complete professional sequence for teacher education students in four vocational curriculum areas. The third monograph provides specific information not only on the tracking and profiling of individual students but also on the control facility, the personnel involved in system management, computer components, information generated, and output data. (JN)

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PROFILING AND TRACKING STUDENTS IN C/PBTE PROGRAMS

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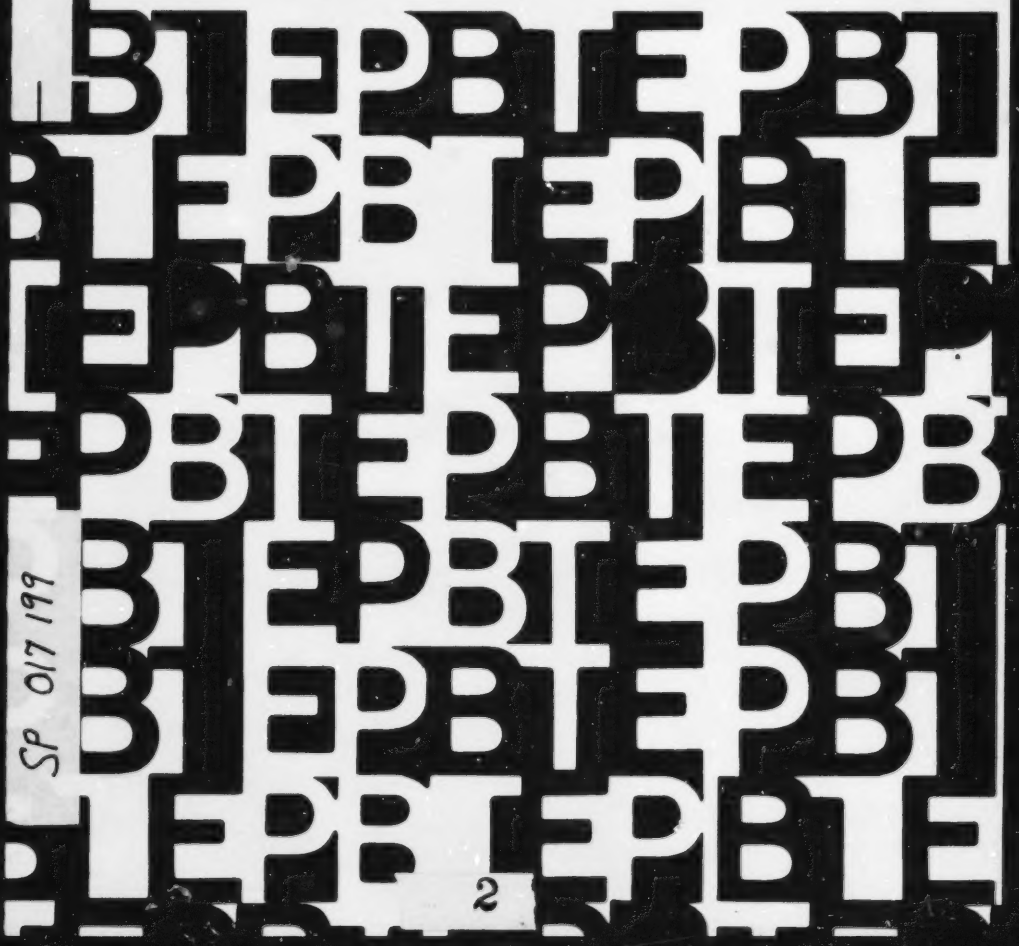

SP 017 199

PROFILING AND TRACKING STUDENTS

IN C/PBTE PROGRAMS

COMPUTER MANAGEMENT OF STUDENT RECORDS IN A COMPETENCY-BASED TEACHER EDUCATION SYSTEM

by

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A COMPUTERIZED STUDENT DATA SYSTEM FOR CBTE PROGRAM SUPPORT

by

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PROFILING AND TRACKING STUDENTS THROUGH THE UTILIZATION OF A COMPUTERIZED INFORMATION SYSTEM

by

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Committee on Performance-Based Teacher Education

May 1976

American Association of Colleges for Teacher Education
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Washington, D.C. 20036

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Preface

The American Association of Colleges for Teacher Education (AACTE) is pleased to publish these three papers as the second in a series of technical assistance papers sponsored by its Committee on Performance-Based Teacher Education. The first in the series [1] addressed the problem of how to determine which competencies should be included in a preparation program for teachers. This publication addresses the problem of designing and implementing a records keeping system for a C/PBTE program.

Whereas the PBTE monograph series [2], also sponsored by AACTE's Committee on PBTE, is designed to expand the knowledge base about issues, problems, and prospects regarding PBTE, the technical assistance papers are targeted more specifically at providing solutions for the practical problems encountered by operators of performance-based programs. The opinions expressed in these papers reflect the views of the respective authors and do not necessarily carry the endorsement of AACTE or its PBTE Committee.

When a competency- (performance-) based approach is applied to educational personnel development programs, the problem of how to maintain student records effectively arises. The problem is complicated when, as is the case in most C/PBTE programs, instruction is individualized and learner-paced. The problem is further complicated when large numbers of students are enrolled in such programs. A record of students' achievement (or non-achievement) of the specified competencies is essential if appropriate feedback is to be provided. The purpose of this technical assistance paper is to present in detail the record keeping systems utilized by three universities which operate C/PBTE programs. The authors write from a background of experience in designing and implementing such systems.

AACTE acknowledges with appreciation the role of the National Center for Improvement of Educational Systems (NCIES) of the U.S. Office of Education in the PBTE Project. Its financial support (provided through the Texas Education Agency) as well as its professional stimulation, particularly that of Allen Schmieder, are major contributions to the Committee's work.

The Association also acknowledges the contribution of members of the Committee who served as readers of these papers. Special recognition is due Margaret Lindsey, member of the Committee and chairwoman of its publication task force; William Drummond, Chairman of the Committee; and to Shirley Bonneville of the Project staff for their contributions to the development of this publication.

Karl Massanari
Associate Director, AACTE
Director, PBTE Project

1/Patricia M. Kay, *What Competencies Should Be Included in a C/PBTE Program?* (American Association of Colleges for Teacher Education, Washington, D.C., 1975).

2/For a complete listing of AACTE and PBTE publications, write to: Order Department, AACTE, One Dupont Circle, Suite 610, Washington, D.C. 20036.

Introductory Commentary

The Committee on Performance-Based Teacher Education, from the beginning, was charged with responsibility for continuous examination of the movement, both in its theoretical and practical dimensions. Toward that end, the Committee has carried on various kinds of activity, an important one of which has been the publication of a series of monographs. With the exception of three that are statements by the Committee itself (PBTE Series: Nos. 1, 16, and 19), the monographs present selected authors' descriptive accounts, analytical statements, or points of view on problems, issues, or elements in PBTE which the Committee viewed as needing special attention. The series is impressive in its comprehensiveness, treatment of urgent problems, and analyses of important differences in interpretation and point of view.

As institutional groups and individual educators engaged in serious and productive efforts to design programs consistent with the essential characteristics of PBTE, it became increasingly clear that certain problems or difficulties encountered would profit from technical assistance. Demands for such assistance were widespread. Responding to the call, the Committee launched a series of Technical Assistance Papers. Prepared by Patricia Kay, the first one provided specific help on the derivation and definition of competencies. This present paper is the second in the TAP series.

Some of the requirements that accompany competency-based programs are staggering in their impact on traditional operational modes in teacher education. Individualization is a challenge to the course-credit syndrome, to typical record keeping, to systems employed by registrars, to deployment of faculty, and to production and use of instructional materials. The insistent demand for evidence -- continuous feedback for students, performance evaluation, validation of competencies, bases for decision making, program evaluation and planning--disturbs complacency and forces reconsideration of many aspects of instruction, curriculum designing, student-faculty relationships, and data storage and retrieval. The increasing significance of research as an integral part of PBTE programs is widely recognized, even though action in designing, conducting, and reporting research relevant to PBTE programs has been minimal and disappointing up to the present time.

Considerable help in dealing with many of the PBTE program requirements can be found in systems designed to facilitate the storage and retrieval of information of various sorts. In the pages that follow, descriptions of three different computerized systems are presented. These systems provide not only for the ready accessibility of information on individual and group progress by students; they accommodate as well means for obtaining data useful in individual and program evaluation, in conducting research, in analysis of time-space-materials-personnel utilization, and in cost accounting.

The Program for Computer Management of Student Records at Florida International University is described by Paul Gallagher. He details three subsystems: a student progress report system, a competency data analysis system, and a program of studies system. Rita Richey and Fred Cook view

the Computerized Student Data System at Wayne State University as a program support system. Specifically designed for the CBTE program in vocational and applied arts, the system provides "on demand" comprehensive student census data and student performance information in relation to specified program goals. The Computerized Information System at The University of Texas at El Paso is discussed by Joe Lars Klingstedt and Stanley Ball. In addition to discussing the system's power for tracking and profiling individual students, the authors provide specific information on the physical set up of the control facility, the personnel involved in operating and managing the system, and the utilization of the university computer for the storage and retrieval of data.

Not any one of the systems described here is assumed to be completely transferable to other locations and programs. It is assumed, however, that these descriptions of concrete, operative systems can be useful to others in the process of designing new systems or modifying existing ones for the accommodation of PBTE program demands.

Educators who reflect on computerized information systems for use in PBTE programs are sensitive to the fact that the quality of data put into the system tends to be reflected accurately in the potential contribution and the actual utilization of output data. A new kind of responsibility rests on the shoulders of both students and faculty -- responsibility for the completeness and accuracy of information fed into the system. New and exciting possibilities confront teacher educators -- possibilities for better and more comprehensive information at their fingertips, for accessibility of data facilitating inquiry into all kinds of significant questions about programs, about instructional behavior, about learning behavior, about materials, and so on.

The descriptions presented here hold promise both for providing technical assistance in dealing with some of the most complex requirements of PBTE programs and for stimulating continued improvement in the quality of instruction and learning in all teacher education programs.

Margaret Lindsey
Chairwoman, PBTE Publication
Task Force

TABLE OF CONTENTS

	Page
PREFACE	iii
INTRODUCTORY COMMENTARY	iv
COMPUTER MANAGEMENT OF STUDENT RECORDS IN A COMPETENCY-BASED TEACHER EDUCATION SYSTEM	1
Introduction	2
Student Progress Report System	3
Red Flag Report System	8
Competency Data Analysis System	11
Program of Studies System	16
Implementation Status	18
Summary	18
A COMPUTERIZED STUDENT DATA SYSTEM FOR CBTE PROGRAM SUPPORT	19
Introduction	20
Principles and Policies	22
Goals of the Student Data System	23
Managing Student Census Data	23
Managing Student Performance Data	30
Analysis and Conclusions	36
Appendix	38
A Summary of Data Collected	38
A Summary of Reports	38
PROFILING AND TRACKING STUDENTS THROUGH THE UTILIZATION OF A COMPUTERIZED INFORMATION SYSTEM	39
Introduction	40
System Description and Applications	42
Future Applications	53

COMPUTER MANAGEMENT OF STUDENT RECORDS

IN A

COMPETENCY-BASED TEACHER EDUCATION SYSTEM

by Paul D. Gallagher
Associate Dean
School of Education
Florida International University
Miami, Florida

Introduction

A general problem that exists in teacher education institutions today is the need to make efficient utilization of available resources at a time when the resources have been stabilized or are even shrinking. Institutions, particularly those which have implemented competency-based teacher education programs, are increasingly being held accountable for their products. They are being asked to demonstrate and document the capabilities of the students they train in terms of the accomplishment of teaching competencies. The problem that these institutions are confronted with is how to deploy their resources to operate existing programs in an efficient and effective manner while at the same time allowing for continued program development, research, etc. One obvious solution to this dilemma is to turn to technology, particularly the computer.

Over the past ten years, there have been great strides taken toward the use of computers in the computer-assisted instruction mode. However, it now appears that the computer will have its greatest impact on the management rather than the instructional side of the teaching/learning process. As the role of the professor in a competency-based teacher education program moves from one of a disseminator of information to more of a facilitator of learning and performance, a support system must be developed to aid in the collection, management, and analysis of the myriad of data that the CBTE system generates.

In general, the purpose of this paper is to present the efforts being conducted in the School of Education at Florida International University to overcome the problems related to the management of student data generated by a CBTE program. This report will focus on the manner in which FIU's computer system is and will be used throughout the School's CBTE program. The system developed was designed to aid students, professors, and administrators in the overall decision-making process. This system provides for the collection, management, and analysis of all performance data as students progress through their programs. Specifically, the components and objectives of the system to be described in this report are as follows:

1. Student Progress Report System: Establish a student progress report system to track students through courses, modules, tasks, and enablers and to provide instructors and students with a weekly status report.

2. Red Flag Report System: Establish an early warning system to alert instructors to students who are not meeting preestablished time and attempt criteria in regard to performance of particular tasks.

3. Competency Data Analysis System: Establish a data analysis system which would provide for the instructor a complete summary analysis of all student progress in relation to the modules, tasks, and enablers for a particular course.

4. Program of Studies System: Establish a student record maintenance system which contains the status of the students' planned program courses and progress through them.

Student Progress Report System

The Student Progress Report System was developed so that the instructor and his/her students would be in a position to continuously track progress of achievement of required competencies in terms of modules, tasks, and enablers.

The initial step in utilizing the Student Progress Report System is for the professor to complete a Course Structure Table Input Form (See Exhibit 1). The information contained on this form is used by the system to build the Course Structure Table which serves as the course/module/task/enabler matrix for which student data will be generated. Course structures can be changed each quarter. Exhibit 1 serves as an example for EDU 507. Columns 3-8 contain the course prefix - EDU 507. Columns 10-11 contain the total number of modules in the course - 04. Columns 13-14 indicate the number of tasks in Module #1 - 02. Each pair of columns from 15-34 contain the number of enablers per task. Note that Task #1 has one enabler while Task #2 has three. Columns 36-57 contain the same information for Module #2, columns 59-80 for Module #3, etc.

Once the course structure has been established, the system is ready to receive and manage student achievement data. As a student attempts any individual task or set of tasks and/or enablers, the data is placed on the Task/Enabler Attempt Form (Exhibit 2). Depending on the evaluation system being used, the form may be completed by the professor, student, or authorized assessor in the School of Education's Assessment Center.

Exhibit 2 is an example of a completed Task/Enabler Attempt Form. It shows that Mary Smith is enrolled in Section 03 of EDU 312. She has just successfully completed Task #1 and Enabler #1 of Module #1. She also made an unsuccessful attempt at Enabler #1 of Task #2, Module #2.

Once completed, these forms are turned over for keypunching. The keypunched forms are then used for the updating of the student's progress report.

The Student Progress Report (Exhibit 3) is produced on a regular basis using the information collected via the Task/Enabler Attempt Form. This report indicates both the rate and performance status of students as they progress through the modules, tasks, and enablers for a particular course. The report allows both the professor and his students to monitor all progress toward the achievement of required course competencies.

The Student Progress Report has two formats. One format (Exhibit 3) reflects student progress in regard to modules and tasks. The second format (Exhibit 4) reflects student progress in regard to modules, tasks, and

COMSPEC COURSE STRUCTURE TABLE INPUT FORM

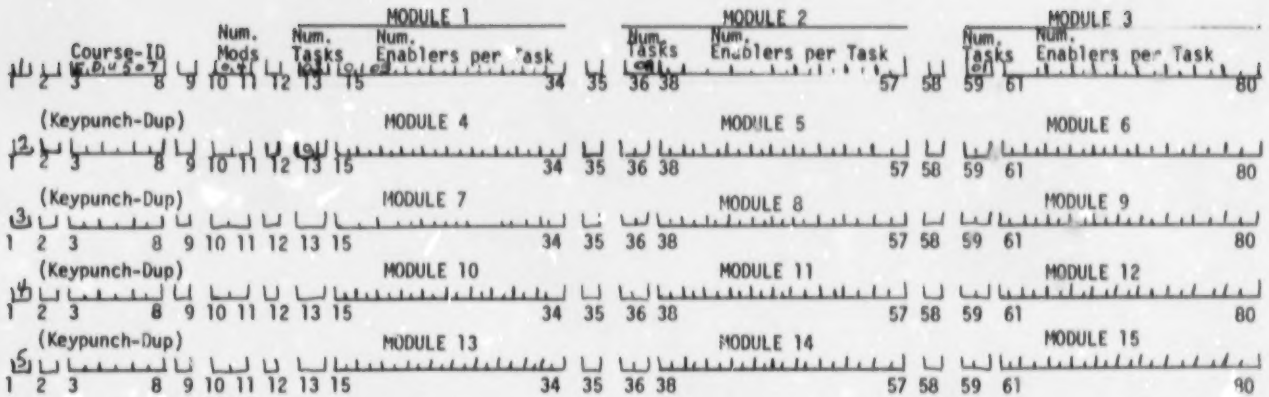

EXHIBIT 1

GEN. TEACH. LAB II
KAMPSNIDER, SEC 03

TASK/ENABLER ATTEMPT FORM

HUMAN RELATIONS
FOR TEACHERS

1	2	3	4	5	6	7	8	9	10
3	1	6	2	1	3	2	7	3	

Student Social Security

11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
S	M	I	T	H		M	A	R	Y										

Student Name (Last, First)

Course ID	31	32	33	34	35	36	37
ED	U		3	1	2		0	3

Prefix Number Sec.

Instructor Code	38	39
0	1	0

THIS SECTION TO BE COMPLETED ONLY BY THE PROFESSOR OR ASSESSOR.

MOD	41	42	TASK	43	44	ENABLER	45	46	DATE	47	48	ATT/COMP	54
0	1		0	1		0	1		0	1	2	2	7	5		1	
MOD	55	56	TASK	57	58	ENABLER	59	60	DATE	61	66	ATT/COMP	67
0	1		0	1			1		0	1	2	2	7	5		1	
MOD	68	69	TASK	70	71	ENABLER	72	73	DATE	74	79	ATT/COMP	80
0	2		0	2		0	1		0	1	2	2	7	5		0	

Signature: Instructor J K KAMPSNIDER Assessor _____

EXHIBIT 2 Task/Enabler Attempt Form

STUDENT PROGRESS REPORT

INSTRUCTOR: JONES, JASON DATE: 03/11/75

COURSE: EDU 507 SECTION 01

AN ASTERISK (*) DENOTES THAT A TASK HAS BEEN COMPLETED

A NUMBER INDICATES THE NUMBER OF ATTEMPTS MADE AT THAT TASK OR ENABLER

		MODULE	1	1	2	2	3	3	3	4	4
		TASK	1	2	1	2	1	2	3	1	2
APPLE, JANE	168-32-0812		*	*	*	*	*	*	*	*	*
ALBIG, KAREN	191-31-0321		*	*	*	*	*	*	*	*	*
BENTLY, THOMAS	681-12-2122		*	*	*						
CALHOUN, SAMUEL	689-13-2223		*	*	*	*	*				
FENDER, HAROLD	986-14-2324		*	2							
NALE, MARY	382-15-2425		*	*	*	*	*	*	*	*	*
PAUL, THOMAS	164-16-2526				*	*					
SAMUELS, ROBERTA	178-17-2627		*	*	*	*	*				
SMITH, JUDITH	584-18-2728		*	*	*						
WONG, WENDY	321-19-2829		*	*	*	*	*	*	*	*	*

14

EXHIBIT 3 Module/Task Progress Report

STUDENT PROGRESS REPORT

INSTRUCTOR: JONES, JOHN DATE: 03/11/75

COURSE: EDU 507 SECTION 01

AN ASTERISK (*) DENOTES THAT A TASK HAS BEEN COMPLETED

A SLASK (/) DENOTES THAT AN ENABLER HAS BEEN COMPLETED

A NUMBER INDICATES THE NUMBER OF ATTEMPTS MADE AT THAT TASK OR ENABLER

		MODULE	1	2	2	3	3	3	3	4	4
		TASK	1	1	1	1	1	1	2	1	1
		ENABLER		1		1	2			1	
APPLE, JOHN	162-13-0751		*	/	*	/	/	*	*	2	
BUDD, THOMAS	212- 2-2121		*	/	*	/	/	2			
BALL, MARTHA	313-24-0721		*	/	*	/	/	*	*	/	*
CAWL, STEVEN	324-25-0621		*	/	*	/	/				
CRABB, PAUL	456-21-1234		*	/	*	/	/	*	*	/	*
HAUL, JOHN	156-24-4321										
FEND, MARY	165-17-3216		*	/	*	/	/	*			
GOOD, DICK	726-45-1111		*								
JACOBS, MICHAEL	842-57-7821		*	/	*						
MORE, PAT	224-58-9596		*	/	*	/	/	*	*		
POTTER, ETHEL	398-63-9841		*	/	*	/	/	2			

EXHIBIT 4 Module/Task Enabler Progress Report

enablers. Either of these report formats may be requested by the professor, depending on his data needs.

Each report contains all of the vital information about the course. This includes the name of the instructor, course number, and section number. All students enrolled in the course are listed in alphabetical order with their social security numbers. Module, task, and enabler identification numbers are also listed.

In each report, an asterisk (*) indicates that a particular task has been successfully completed. A slash (/) indicates that a particular enabler has been attempted and successfully completed. If a student attempts a task and/or enabler and is not successful, the number of the attempt is indicated. For example, in Exhibit 3, Harold Fenner was unsuccessful on two (2) attempts at Module #1, Task #2. Once that task has been successfully accomplished, the appropriate symbol is placed on the report.

Red Flag Report System

Once the professor has completed his Course Structure Table, he is ready to establish the Red Flag requirements for the particular set of modules. This is accomplished through the completion of the Red Flag Input Form (Exhibit 5). Here the professor defines specific performance criteria regarding student progress. This criteria serves as early warning signals to allow the professor to be aware of places where students may be experiencing difficulty in their progress toward meeting the objectives of the course. This red flagging or early warning system allows the professor to be alerted to students who are: (1) spending too much time on a particular module; (2) spending too much time on a particular task; and/or (3) apparently having trouble, expressed by the number of attempts at a particular task.

Exhibit 5 depicts the Red Flag Input Form for EDU 507. The professor has set three different conditions for the course. The first condition provides for the flagging of any student who has taken more than 14 days and/or has attempted (without success) Task #1 of Module #1 at least two times. The second condition signals when a student has taken more than 7 days on Module #2. The third condition provides for the flagging of any student who has attempted Module #4, Task #2 more than two times. The professor may establish as many red flag conditions as he desires.

Along with the Student Progress Report(s), the professor may request the Red Flag Exception List (Exhibit 6) for his particular course or courses. This report is simply a reflection of those students who have violated the criteria established by the professor on the Red Flag Input Form just described. The report alerts the professor to those students who are having trouble with particular tasks. The professor can use this information in counseling those students who are apparently experiencing the difficulty. Exhibit 6 depicts an example of a Red Flag Exception List for EDU 507, Section 08. All three of the students have been flagged on both time and attempt data. Professor Jones would probably call all three of these

EXHIBIT 5

RED FLAG INPUT FORM

COURSE ID (1–6)	PROFESSOR CODE (7–9)	MOD. NO. (10–11)	TASK NO. (12–13)	PERIOD* (14–15)	ATTEMPTS+ (16)
E01057	029	01	01	14	2
E04507	029	02		07	
E01505	029	04	02		2

* Time period not to be exceeded, in days

\+ The number of attempts on a task not to be exceeded

17

INSTRUCTOR: JONES, ROBERT DATE: 03/11/75

COURSE. EDU 507 SECTION 08

RED FLAG EXCEPTION LIST

STUDENT	SOC-SEC-NO	MODULE	TASK	TIME PERIOD	TIMES ATTEMPTED
ALLEN THOMAS	222-55-6889	04	02	14 DAYS	03
GROVE, HAROLD	214-56-9891	02	01	12 DAYS	02
RAWLS, MARY	445-87-9999	01	03	21 DAYS	02

EXHIBIT 6: Red Flag Exception List

students in to attempt to determine what could be causing the apparent difficulties and, hopefully, set the students back on track.

Competency Data Analysis System

Since a competency-based program claims to be data dependent, it was necessary to develop a data analysis subsystem to massage all of the collected student data into a form that would allow it to be easily understood and interpreted. To accomplish this, programs were developed that produce four reports: (1) Course Completion Report; (2) Module Analysis Report; (3) Task Analysis Report; and (4) the Enabler Analysis Report. A brief description of each follows.

Course Completion Report: Thus far, the reports described serve as student monitoring reports in addition to providing early warning signals for students. However, once a particular quarter has ended, the professor requires a report that could provide the status of the entire class in relation to the completion of course competencies. For this purpose, the Course Completion Report was developed. This report (Exhibit 7) provides for the professor two types of information. First, it lists all of the students who have successfully completed all of the tasks for a particular course. Since enablers are prerequisite to tasks, this would indicate that all work for the course has been completed. Secondly, the report indicates, in a list, the status of all of the students who have not met the course completion requirements. The example presented in Exhibit 7 indicates that twelve (12) students have completed the course and four (4) have not.

Module Analysis Report: This report was designed to provide the professor with summary information on the manner in which students proceeded through the modules for a particular course. As can be seen in Exhibit 8 the report includes the mean number of modules completed and the mean number of days the class required to complete each module. Additionally, the report includes a frequency distribution of the days required to complete each module as well as the total number of students completing each module. All of this information can be utilized in the revision process and future course planning and management.

Task Analysis Report: This report was designed to provide the professor with summary information on the manner in which students proceeded through the tasks for a particular course. Exhibit 9 is provided as an example of the Task Analysis Report. The mean number and a frequency distribution of attempts are provided. Further, the report yields a frequency distribution of the number of days it took to complete each task and the overall mean number of days per task. Finally, the report indicates the total number of students completing each task. This data is not only valuable for course revision and management but also for research purposes.

Enabler Analysis Report: The Enabler Analysis Report (Exhibit 10) provides the same information at the enabler level as the Task Analysis Report at the task level.

INSTRUCTOR: JONES, ROBERT SPRING QUARTER

COURSE: EDU 507 SECTION 01

STUDENT COMPLETION DATA - TASKS

CREDIT STUDENTS: THE FOLLOWING STUDENTS HAVE COMPLETED ALL TASKS

ALBIG, KAREN
BUDD, JOHN
CARL, THOMAS
HATTER, MARY
GOLD, DINA
ISABEL, JOAN
JACKSON, JOHN
KILN, PATRICIA
LAWRENCE, WILLIAM
MILLER, JUDY
SOUND, JANE
THOMAS, MARY

NO CREDIT STUDENTS: THE FOLLOWING STUDENTS HAVE NOT COMPLETED ALL TASKS.

COMPLETED TASKS ARE MARKED BY *.

	MODULE	1	2	3	4	5	6	7	8	9
	TASK	1	2	1	1	1	1	1	1	1
BIRD, JOHN		*	*	*	*	*	*	*	*	
GREER, HAROLD		*	*	*	*					
HALL, MARY		*	*	*						
SMITH, JOAN		*	*							

20

EXHIBIT 7: Course Completion Report

COURSE ANALYSIS

INSTRUCTOR: TAYLOR, RICHARD
COURSE: EDU 507 SECTION 01

FALL QUARTER 1974

MODULES

	MOD 1	MOD 2	MOD 3	MOD 4	MOD 5	MOD 6	MOD 7	MOD 8	MOD 9
MEAN TIME TO COMPLETION	19.5	11.2	9.6	6.8	7.1	8.6	10.9	4.7	4.1

FREQUENCY DISTRIBUTION OF TIME TO COMPLETION IN DAYS

DAYS	MOD 1	MOD 2	MOD 3	MOD 4	MOD 5	MOD 6	MOD 7	MOD 8	MOD 9
0.1 - 1.	3	2	4	3	4	2	4	1	5
1.1 - 2.		1	2	2				1	2
2.1 - 3.		3	3	3	3	2	3	2	2
3.1 - 4.		1	2	3	4	4	3	5	5
4.1 - 5.		4	4	4	2	2	2	2	2
5.1 - 6.		2	2	5		1	1	3	
6.1 - 7.		2	2	3	5	3	5	1	2
7.1 - 8.	3					1		2	
8.1 - 9.	1	2	5	3					
9.1 -10.	5		1	1	7	2	6		
10.1 -11.		1	1	2					2
11.1 -12.		3	1						
12.1 -13.		1	2	2	1	4			
13.1 -14.		5			2	2	2		
14.1 -15.	2	1							
15.1 -20	4	2	4	2	1	1			
21.1 -25.	7	1	4			1			
25.1 -30.	4	1							
30.1 -UP.	7	2					6		
TOTAL STDS COMPLETING MOD	35	34	37	33	29	25	32	17	20

NOTE: EACH COMPUTATION IS BASED ONLY ON THOSE STUDENTS WHO COMPLETED THE MODULE (OR TASK).

EXHIBIT 8: Module Analysis Report

COURSE ANALYSIS

INSTRUCTOR: MOORE, ROBERT
COURSE: EDU 507 SECTION 01

FALL QUARTER 1974

TASKS

	M1-T1	M1-T2	M2-T1	M3-T1	M4-T1	M5-T1	M6-T1	M7-T1	M8-T1	M9-T1
Mean Number of Attempts	1.1	1.1	1.3	2.1	1.6	1.1	1.5	1.4	1.3	1.0

FREQUENCY DISTRIBUTION OF NUMBER OF ATTEMPTS

ATTEMPTS	M1-T1	M1-T2	M2-T1	M3-T1	M4-T1	M5-T1	M6-T1	M7-T1	M8-T1	M9-T1
1	25	26	22	1	15	24	18	19	21	27
2	3	2	3	22	8	4	6	7	6	1
3			3	5	5		4	2	1	
4										
5 or more										

	M1-T1	M1-T2	M2-T1	M3-T1	M4-T1	M5-T1	M6-T1	M7-T1	M8-T1	M9-T1
Mean Time to Completion	12.9	10.1	10.4	6.3	6.1	5.6	7.4	6.4	4.2	3.4

FREQUENCY DISTRIBUTION OF TIME TO COMPLETION IN DAYS

DAYS	M-T1	M1-T2	M2-T1	M3-T1	M4-T1	M5-T1	M6-TL	M7-T1	M8-T1	M9-T1
0.1 - 1.	2	3	2	4	3	4	2	4	5	5
1.1 - 2.	1		1	2	2				1	2
2.1 - 3.		2	1	3	3	3	2	3	2	2
3.1 - 4.	2	2	1	2	3	4	4	3	5	5
4.1 - 5.	1	1	4	4	4	2	2	2	2	2
5.1 - 6.		1	2	2	1		1	1	3	
6.1 - 7.			2	1	3	8	3	5	1	2
7.1 - 8.	3	2					1		1	
8.1 - 9.	3	3	1	1	1					
9.1 -10.	1	2		1	1	1	2	1		
10.1 -11.			1	1	1					1
11.1 -12.	4	3	3	1						
12.1 -13.	1	1	1	2	2	1	1			
13.1 -14.			1			1	2	2		
14.1 -15.	3	2	1							
15.1 -20.	2	4	2	1	2	1	1		1	
21.1 -25.	6	1	1	1			1			
25.1 -30.		1	1							
30.1 -UP.	1		1					1		
TOTAL STDS COMPLETING TASK	30	28	26	26	26	25	22	22	21	19

EXHIBIT 9: Task Analysis Report

COURSE ANALYSIS

INSTRUCTOR: WAGGONER, HENRY
COURSE: EDU 507 SECTION 01

FALL QUARTER, 1974

ENABLERS

	M1-T1 E-1	M1-T1 E-2	M1-T2 E-1	M1-T2 E-2	M2-T1 E-1	M2-T1 E-2	M2-T1 E-3	M3-T1 E-1	M3-T1 E-2	M4-T1 E-1	M4-T1 E-2	M5-T1 E-1	M5-T1 E-2	M5-T1 E-3	M6-T1 E-1
MEAN NUMBER ATTEMPTS	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

FREQUENCY DISTRIBUTION OF NUMBER OF ATTEMPTS

ATTEMPTS	M1-T1 E-1	M1-T1 E-2	M1-T2 E-1	M1-T2 E-2	M2-T1 E-1	M2-T1 E-2	M2-T1 E-3	M3-T1 E-1	M3-T1 E-2	M4-T1 E-1	M4-T1 E-2	M5-T1 E-1	M5-T1 E-2	M5-T1 E-3	M6-T1 E-1
1	30	29	29	30	30	27	24	26	26	26	26	25	26	23	24
2		1	1				1					1		1	1
3															
4															
5 OR MORE															

	M1-T1 E-1	M1-T1 E-2	M1-T2 E-1	M1-T2 E-2	M2-T1 E-1	M2-T1 E-2	M2-T1 E-3	M3-T1 E-1	M3-T1 E-2	M4-T1 E-1	M4-T1 E-2	M5-T1 E-1	M5-T1 E-2	M5-T1 E-3	M6-T1 E-1
MEAN TIME TO COMPLETION	5.2	5.1	4.3	3.8	3.5	4.1	4.7	1.8	1.6	1.8	1.8	4.2	1.8	2.2	1.4

FREQUENCY DISTRIBUTION OF TIME TO COMPLETION IN DAYS

DAYS	M1-T1 E-1	M1-T1 E-2	M1-T2 E-1	M1-T2 E-2	M2-T1 E-1	M2-T1 E-2	M2-T1 E-3	M3-T1 E-1	M3-T1 E-2	M4-T1 E-1	M4-T1 E-2	M5-T1 E-1	M5-T1 E-2	M5-T1 E-3	M6-T1 E-1
0.1 - 1.	2	2	4	6	4	4	3	9	10	8	8	8	11	9	13
1.1 - 2.	4	4	4	4	7	5	5	10	10	10	10	7	6	6	7
2.1 - 3.	2	2	2	2	6	3	2	2	2	4	4	4	4	3	2
3.1 - 4.	5	6	7	7			3	3	2	2	2	3	2	1	2
4.1 - 5.	2	1	1	2	1	1	3	2	2	2	2	2	3	4	1
5.1 - 6.	6	7	6	6	7		1								
6.1 - 7.	1	1	2	1	1	2	1								
7.1 - 8.	4	2	1			1	2							1	
8.1 - 9.	1	2	1	1											
9.1 -10.	2	2	2	1		1									
10.1 -11.	1	1													
11.1 -12.							1								
12.1 -13.					1										
13.1 -14.							1								
14.1 -15.						1									
15.1 -20.							1					1			
21.1 -25.												1			
25.1 -30.															
30.1 -UP.															

TOTAL STD COMP. ENABLER	30	30	30	30	30	27	25	26	26	26	26	26	26	24	25

THIS ANALYSIS IS BASED ONLY ON THOSE STUDENTS WHO COMPLETED THE ENABLER.

EXHIBIT 10: Enabler Analysis

Program of Studies System

While the system just described was designed as an in-course management system, the Program of Studies System was developed to manage the overall program status of students enrolled in the School of Education. The major purpose of the Program of Studies is to provide an individualized auditing system for monitoring the course requirements of all undergraduate and graduate students. While the individual Student Progress Reports provide for the professor and the students an audit trail between modules, tasks and enablers, the Program of Studies provides similar information at the course level. It is an easy and clear way by which the student and his advisor audit progress toward the degree.

As can be seen by reviewing Exhibit 11, the Program of Studies maintains data in seven major categories of progress toward the degree. The categories are as follows:

Transfer and Lifework Credit - This part of the record contains the number of quarter hours that the student has transferred in from another university or hours that he has received for life experience related to his teacher education program. In the example, John Smith has not received any credit in this category.

Completed Program of Studies Courses - This category includes the complete listing of designated Program of Studies courses completed by the student. The number of hours, grades, and quarter taken are also indicated. In the example, Mr. Smith has completed 35 of his required hours.

Currently Enrolled Programs - The official Program of Studies course(s) presently being taken are listed under this category. The example shows that the student is presently enrolled for EEL 425 - Student Teaching.

Future Program of Studies Courses - This section of the report indicates the required courses that have yet to be completed. The student in the example has planned for 10 hours of electives and EEL 411.

Program of Studies Courses with NC Grades - Required courses for which the student received a No Credit (NC) grade are indicated in this category. Unless appropriate substitutions are made, these courses must be made up.

Courses Not Designated Program of Studies - Should a student take a course or courses that were not in his planned program, they would appear in this category. Mr. Smith took three courses which were not in his planned program.

In addition to the seven general categories of types of courses, the Program of Studies maintains a continuous tally of the number of program hours required, the number taken, and the number remaining to be taken. This information is updated quarterly to provide the student and

EXHIBIT 11

STUDENT I.D. 305 66 2766 — PROGRAM OF STUDIES — DATE 10/31/74

	ACTION		COURSE	NO.	COURSE TITLE	CREDITS	GRADE		ENROLLED		PROGRAM OF STUDIES	FUTURE QUARTER	ADVISOR 21	
1					* Transfer and Lifework Credit *									1
2					-- None --									2
3														3
4					* Completed Program of Studies Courses *									4
5		73908	EDU	311	General Teaching I	5.0	CR		973	*	***			5
6		73912	EDU	312	Gen Tch Lab II	5.0	CR		973	*	***			6
7		74104	ECE	502	Cur Instr Early Chhd	5.0	CR		174	*	***			7
8		74108	EEL	306	Aesthetic Exper Child	5.0	HC		174	*	***			8
9		74112	SPA	311	Begin Intens Spanish	5.0	CR		174	*	***			9
10		74312	EDU	305	Schooling in Amer	5.0	CR		374	*	***			10
11		74316	EEL	412	Dev Attit Skill Inqit	5.0	CR		374	*	***			11
12														12
13					* Currently Enrolled Courses *									13
14		749	EEL	425	Student Teaching	15.0			974		***			14
15														15
16					* Future Program of Studies Courses *									16
17		995	ZZZ	000	Elective	10.0					***			17
18			EEL	411	Dev Attit Skill Inqit I	5.0					***	F 74		18
19														19
20					* Program of Studies Courses with NC Grades *									20
21					-- None --									21
22														22
23					* Courses Not Designated Program of Studies *									23
24		73904	EDU	305	Schooling in Amer	5.0	NC 3		973					24
25		74304	ECE	501	Early Child Ed Prog	5.0	HC		374					25
26		74308	ECE	595	Ind St Early Child	5.0	HC		374					26
27														27
28					* Currently Enrolled Non-Program of Studies *									28
29					-- None --									29
30														30
31														31
32														32
33														33
34														34
35														35
36														36
37														37
38														38
39														39
40														40
41														41
42														42
43														43
44														44
45														45
46														46
47														47
48														48
49														49
50														50

SCHOOL: ED — MAJOR: 0802 — Elementary Educ — ENTRY DATE: 0973 — ADVISEMENT DATE: _____

DEGREE HOURS REQUIRED	TRANSFER HOURS ACCEPTED	PROGRAM-S HOURS REQUIRED	PROGRAM-S HOURS LISTED	PROGRAM-S HOURS NEEDED
TBD.0	0	TBD.0	85.0	115.0

CURRENTLY ENROLLED 15.0
FIU DEGREE HOURS COMPLETED 35.0
DEGREE HOURS REMAINING 130.0

Smith John
1895 Beach Ave.
Miami, Fl 33141

Phone 821-9111

STUDENTS SIGNATURE _____ ADVISORS SIGNATURE _____

STUDENTS SHOULD SEE FACULTY ADVISOR TO MAKE CORRECTIONS AND/OR CHANGES TO INDIVIDUALIZED PROGRAM OF STUDIES

ADVISOR 1

his advisor with a clear indication of the exact status of the student.

The development of the Program of Studies is a joint effort of the student and his advisor. Once the program courses are decided upon, the information is forwarded to the Office of Registration and Records. From there, it is keypunched and entered into the computer. The completed Program of Studies is printed during the first several weeks of each quarter and forwarded to both the advisor and the student. Changes, deletions and/or additions to the Program of Studies can be made by writing them on the form and resubmitting it to the Registrar.

Implementation Status

The program management systems just described were designed for Florida International University's UNIVAC 1106 computer system. In regard to implementation, the Program of Studies System is complete and operational. All 1800 graduate and undergraduate students in the School of Education are required to have a Program of Studies to be used as a program guide and contract while they are matriculating. Programs of Studies have been utilized for the past two years and have now become the official record that students and advisors use from the first academic planning session through graduation. Both students and faculty have found this system useful and helpful. The individualized management component has been completed and field tested but to date has not been implemented schoolwide.

Summary

The overall purpose of this report was to describe the computer information management system developed at Florida International University. The system was specifically designed to monitor and manage data of students enrolled in an individualized competency-based program. The system can provide the professor with student progress reports, early warning reports on students in trouble, and a complete analysis of all course data. Additionally, the system maintains a complete program of studies for each and every student.

A COMPUTERIZED STUDENT DATA SYSTEM

FOR CBTE PROGRAM SUPPORT

Rita C. Richey
Assistant Professor
Division of Teacher Education
Wayne State University

Fred S. Cook
Director
Institute for the Research and Development
of Competency-Based Teacher Education
Wayne State University

Introduction

Much of the debate over competency-based education stems from the ways in which existing programs are operated as well as from the basic CBE concepts themselves. Given the power of these concepts, CBE cannot succeed unless there is a matching body of knowledge and skill in efficiently operating such programs. One of the commonly cited concerns in relation to actual program implementation is the difficulty in managing the voluminous amount of data which can potentially emerge. Often these data are needed to profile students and track their progress. This is a technical problem which must be met with practical, inexpensive solutions. This paper describes one attempt to collect, sort, and utilize student data generated from the operation of a CBE program in such a way as to help students and faculty, and to promote the continuous upgrading of the program itself. (See Appendix for A Summary of Data Collected and A Summary of Reports, p. 38.)

This student data system is a part of the ongoing competency-based program of Vocational and Applied Arts Education (VAE). This is a unit in the Division of Teacher Education in the College of Education at Wayne State University in Detroit, Michigan. The VAE undergraduate program includes approximately 500 students on the active role and has been in operation since 1972. The program is a complete professional sequence for teacher education students in four vocational curriculum areas consisting of four major phases:

1. Introduction to Vocational and Career Education
2. Foundations of Education
3. Methods of Instruction
4. Intern Teaching

Exhibit 1 shows these phases and their sequence. The program is field-oriented and is entirely under the direct control of the VAE faculty.[1]

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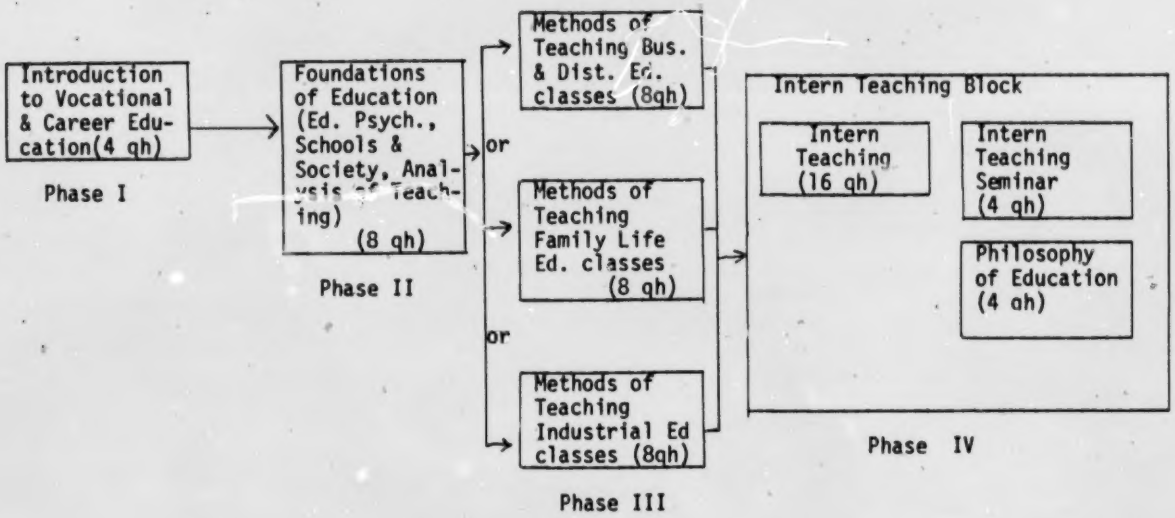
[1]For a more complete description of the VAE instructional system, see "A Competency-Based Program for Preparing Vocational Teachers" by Fred S. Cook and Rita C. Richey in The Journal of Industrial Education, Vol 12, N 4, Summer 1975, 29-38.

EXHIBIT 1
A DIAGRAM OF THE VAE
UNDERGRADUATE CBTE PROGRAM*


Introduction to Vocational & Career Education(4 qh)
Phase I
Foundations of Education (Ed. Psych., Schools & Society, Analysis of Teaching) (8 qh)
Phase II
or
Methods of Teaching Bus. & Dist. Ed. classes (8qh)
Methods of Teaching Family Life Ed. classes (8 qh)
Methods of Teaching Industrial Ed classes (8qh)
Phase III
Intern Teaching Block
Intern Teaching (16 qh)
Intern Teaching Seminar (4 qh)
Philosophy of Education (4 qh)
Phase IV

*A program is being defined as "an organization of subject matter and interrelated learning experiences designed to lead students to achieve pre-specified goals and objectives on a systematic basis. A program usually consists of two or more courses." This definition is from Program Goals, a self-contained module produced by Vocational and Applied Arts Education through a contract from the Michigan Department of Education.

The student data system to be described here is but one facet of the computerized VAE Management Information System[2] which supports the competency-based instructional system. Included in the student data system are procedures for collecting and using student census data, as well as student performance data.

Principles and Policies

The design and use of this student data system is based upon some key principles and policies which have shaped the current VAE system and will continue to shape the system in the future. They include the assumptions that a CBTE data system should:

1. Provide direct support of the instructional system and the ultimate goal of competency attainment.
2. Provide prime consideration for the individuality of both the faculty and the students.
3. Provide feedback and information to students about their progress.
4. Promote closer communication with students.
5. Build upon the expressed needs of the faculty who will be implementing the program.
6. Function without specialized support staff.
7. Provide means for reducing faculty record keeping.
8. Include data which is timely, easily obtained, and credible.
9. Provide a base for decisions related to program revision.

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[2]The VAE Management Information System was designed primarily by Dr. Charlotte Neuhauser. A complete description of the MIS can be found in Management Information System by Charlotte Neuhauser, Competency-Based Teacher Education Series: No. 4 (Detroit, Michigan: Vocational and Applied Arts Education, Wayne State University, 1974).

The student data system as described here encompasses the Admissions Subsystem, the Instructional Subsystem, the Field Experience Subsystem, and the Program Evaluation Subsystem. However, the MIS also includes additional subsystems--Class Scheduling, Faculty Load and Clerical .

Goals of the Student Data System

The major objectives of a specific system reflect the design of the total program, as well as the priorities of the developers. In this particular case, there are nine major goals:

Student Census Data Goals

1. To provide an accurate list of active students.
2. To provide an accurate census of students and a profile of these students.
3. To predict future enrollment in each course.
4. To identify students who are deviating from their planned program.

Student Performance Data Goals

5. To provide information to both faculty and students on the status of students as they progress through the program.
6. To provide an up-to-date transcript for each student.
7. To provide a history of students' performance in relation to each performance objective in the program.
8. To provide means by which student reactions can be systematically gathered for use in revising instruction and instructional materials.
9. To provide means by which data can be collected to give direction for program revision and improvement.

The remainder of this paper will describe exactly how these objectives are achieved in the VAE student data system.

Managing Student Census Data

The VAE program is comparatively large, and the students reflect many of the somewhat unique characteristics of all Wayne State University students. Many are working and going to school part-time. Thus, their attendance is not always continuous from quarter to quarter, and it spreads over a long period of time. The students are older (with an average age of 32), and they typically have specified objectives for their higher

education. These conditions create extraordinary problems in the basic tasks of identifying who the active students are, what their characteristics are, and when they will be receiving their VAE instruction. This information is crucial to any systematic program development effort. Thus, the student census data collection becomes an integral part of the first contact a faculty member has with prospective students.

During this first contact, an extended counseling and advising session, the student completes the Plan of Work, (See The VAE Plan of Work, p. 25.) which is essentially a detailed schedule of each student's entire VAE program leading to graduation and provides the following basic information about each student:

- Name
- Address
- Telephone number
- Social Security number
- Rank
- Curriculum area
- Quarter admitted to VAE
- Expected graduation date
- New or revised plan
- Date plan was made or revised

For each VAE course scheduled:
- Course number
- Quarter expected to take course
- Year expected to take course

For each non-VAE course:
- Course number

The remainder of the student census data is retrieved through an interface (based upon the student's social security number) with the general university computerized student records. This data, which is updated quarterly, includes:

- Name
- Address
- Telephone number
- Social Security number
- Sex
- Marital status
- Birthday
- Admission date
- Graduate/undergraduate status
- Senior college
- Residency status
- College
- Curriculum area
- Rank
- Cumulative honor point total
- Cumulative resident hours
- Cumulative total hours
- Cumulative honor point base
- Number of courses recorded

For each course taken:
- Quarter and year course taken
- Section number
- Grade received
- Withdrawal code
- Graduate/undergraduate code
- Credit hours
- Length of course in weeks

This data is stored in the VAE computer files[3] and is available to meet the planning and counseling needs of the faculty.

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[3]These data files are located on disk storage; thus, on-line access is possible. Backup files are stored on magnetic tapes. The entire system utilized two IBM 360, Model 67, computer systems with Fairchild semi-conduit memories. VAE has access to three UCC 1135 terminals and an IBM Magnetic Card Communicating Typewriter for use in generating reports and retrieving data.

OFFICE PLAN OF WORK

CERTIFICATION PLAN OF WORK - UNDERGRADUATE

BUSINESS AND DISTRIBUTIVE EDUCATION

NEW PLAN [1]
REVISED PLAN [2]

BED [1][4][1][0][ ]
DED [1][4][5][0][ ]

ID NUMBER (6-DIGIT ID) | SOCIAL SECURITY NUMBER | LAST NAME | FIRST NAME

ADDRESS | CITY | STATE | ZIP | PHONE

QUARTER ADMITTED TO VAE (YR MO) | EXPECTED GRADUATION DATE (YR MO) | TODAY'S DATE (YR MO)

GENERAL PROFESSIONAL EDUCATION

REQUIRED COURSES	QUARTER & YEAR F	W	SP	SU	
1) TED 5191 CAREER ED (4)	9	1	4	6	19
2) TED 5195 FOUND. ED (8)	9	1	4	6	19
3) TED 5133 BE PRACT (4)	9		4		19
4) TED 5134 BE PR CR (4)	9		4		19
5) TED 4192 INTERN TCHG. (2-18)	9	1			19
6) TED 5193 SEMINAR (4)	9	1			19
7) TRF 3401 PHIL. ED (4)	9	1			19
VAE Electives					
8) TED 4196 DIRECTED ST (2-12)	9	1	4	6	19
9) TED 5131-5151 PRIN (4)	9	1	4	6	19
10) TED 6133-6153 SP PR BE (1-10)		1	4	6	19
11) TED 6136-6156 FIELD ST (2-12)	9	1	4	6	19
12) TED 6153-6153 TCHG DP (2-10)				6	19
13) TED 6192 COOP. WORK ST (6)				6	19
14) TED 6192 COOP. WORK ST (6)				6	19
15) TED 6199 COOR. OCC. (4)		1		6	19
16) _____	9	1	4	6	19
17) _____	9	1	4	6	19

COMPLETED WORK EXPERIENCE (2 yrs/4000 hrs) (SOME HOURS MUST HAVE BEEN COMPLETED WITHIN THE PAST FIVE YEARS)

YES_____ NO_____

COMMENTS_____

THIS PLAN OF WORK IS AN AGREEMENT BETWEEN THE STUDENT AND VAE. NO CHANGES IN THE PLANNED REQUIRED PROGRAM MAY BE MADE UNILATERALLY. ALL CHANGES MUST BE MADE IN WRITING AND APPROVED BY THE COORDINATORS COMMITTEE.

STUDENT SIGNATURE:_____

ADVISER'S SIGNATURE:_____

COORDINATORS COMMITTEE ACTION:

APPROVED_____ NOT APPROVED_____ DATE_____

SIGNED_____

TEACHING MAJOR (56 QH) (Includes VAE 5134)

REQUIRED COURSES (Circle Needed Courses)

*BE/DE **** ***BE

*TED(VAE) 5134
*MKT 0160,0362
*MKT 0366
***MKT 0576
*ACC 0310
*MKT 0342
*MKT 0532
**MKT 0549
**FAC 0547
**FAC 0548
**FAC 0549 **FAC 0571/FAC 0540

ELECTIVES (24 QH)

1) _____
2) _____
3) _____
4) _____

TEACHING MINOR (36 QH)

	NEEDS	
ECONOMICS (16 QH)	_____	QTR HRS
SOC. SCI. ELEC (20 QH)	_____	QTR HRS
OTHER:_____	_____	QTR HRS

GENERAL EDUCATION (36 QH)

ENGLISH ELEC (16 QH)	_____	QTR HRS
SPEECH (8 QH)	_____	QTR HRS
PSYCHOLOGY (4 QH)	_____	QTR HRS
HYGIENE (3 QH)	_____	QTR HRS
PHYS ED (3 QH)	_____	QTR HRS

SUMMARY	REQ.	HAD	NEEDS
1. GENERAL EDUCATION			
A. Teaching Minor	36		
B. General Education	36		
2. PROFESSIONAL EDUCATION	40		
3. TEACHING MAJOR	56		
4. ELECTIVES			
TOTALS (MIN. 186 QH)			

The key question, however, is: what does all of this data do for the faculty? Basically, it lets the faculty know who the students are, what they will be doing, and when. Many critics of computerized data systems say that this information can be gained more effectively and more humanely through daily student contact and interaction. The truth of the situation in many large universities is that it is often extremely difficult, if not impossible, to identify students in a given program. Typically, a faculty advisor has an advisee notebook with literally hundreds of names of persons who have been on the scene at some time. Although frequent interviews are held with the active students, it is still difficult to retrieve data systematically, and decisions are then based upon the memories and impressions of advisors. In the VAE approach, reports are systematically issued based upon faculty needs and priorities. Let us examine the major reports generated from the student census data--the alphabetical listing of students, the census of active students, profile reports, projected enrollments, and the report to students who are not following their plan of work.

All faculty receive the alphabetical listing of their own curriculum area's students on the fifth week of the quarter. These lists contain all active students,[4] their social security numbers, and their current address and phone numbers. Each faculty member has a special notebook to hold these computer printouts. These lists are used for many purposes in addition to the obvious one of providing an accurate, quick means of making contact with students. They have been used to generate mailing labels for professional organizations or for department mailings. They help faculty when assigning students to field experience sites. The alphabetical lists truly become a much used reference and are often used as a cross reference to other reports. (See The Alphabetical List of Students, p. 27.)

The census reports for VAE students provide valuable information, especially in a time of varying student enrollment in colleges of education. They are especially important in a program whose students do not always elect courses on an uninterrupted basis. These reports are compiled quarterly. The general report is a chart which displays the number of students divided into groups according to their degree status, their curriculum areas, and their active or inactive status. As a part of the quarterly report, graphs are made which show enrollment changes by quarter and year. In this way, the faculty can be aware of enrollment trends and use this information for class scheduling and further program planning. An example of the importance of this data occurred when VAE received permission to hire a new instructor, permission which had previously been denied. The pivotal argument was the immediate generation of student census data. (An example of the Student Census Report follows, p. 28.)

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[4]Active students have been defined by the VAE faculty as those students who have taken one or more classes within the last calendar year. Inactive student data remains in the file for two to three years, depending upon the program, and is then removed from the file and microfilmed.

INDUSTRIAL EDUCATION

THIS IS A LIST OF ALL IED ACTIVE STUDENTS. THESE STUDENTS HAVE TAKEN AT LEAST ONE CLASS DURING THE PAST THREE YEARS.

THE KEY TO THE MAJOR AND RANK DESIGNATIONS IS AS FOLLOWS:

MAJOR
403=MAI
148=ALL OTHER IED STUDENTS

RANK
01=FRESHMAN;02=SOPHOMORE;03=JUNIOR;04=SENIOR
06=POST BACHELORS
51,52=MASTER OF EDUCATION
54,55=EDUC. SPECIALIST
57,58=ED.D;67,68=PH.D
11=PRE MAIS;56=PSI ED.SP.

ID	NAME	STREET	CITY	STATE	ZIP	TELEPHONE	MAJOR	RANK
372482152	ALAMEK, LEONARD A	32946 WARENHAM CT	WARREN	MICH	48092	00009398097	403	51
362486377	AGENT, FREDERICK NUMBER,	2149 10 MILE APT 110	STERLING HGTS	MI	48077	00009366863	148	52
386422961	AMEY, JERRY EDWIN	36827 JOY RD	WESTLAND	MI	48185	00005225645	148	4
363504316	ANGELOFF, STEPHEN J	1207 CLOVERDALE	ROYAL OAK	MICH	48067	00005479677	148	4
383400609	ARNOLD, DONALD GEORGE	11010 LANDES CT	ANCHORVILLE	MI	48004	00017253961	148	52
379443699	AVERY, DEAN ARNER	18910 WASTENAW	HARPER WOODS	MI	0	0000527896	148	52
362528330	BAIDOON, FOUAD	25043 FIVE MILE APT B	REDFORD	MI	48239	00005333257	148	52
366400507	BARTON, DANIEL DAVID	2116 NEW YORK	LINCOLN PARK	MICH	48146	00003831723	148	3
382486627	BAYNES, WILLIAM WARREN	16524 GLASTONBURY	DETROIT	MI	48219	00005357398	148	52
280429469	BEAM, GERALD LYNN	36805 CHERRY HILL	WESTLAND	MI	48185	00007228813	148	4
366463131	BEARDSLEE, JOHN ROBERT	31122 SARATOGA	WARREN	MI	48093	00009398696	148	51
386467893	BELTZ, JAMES LEE	3950 PRATT LANE	ATTICA	MICH	48412	00006645775	148	52
367502C92	BENEDICT, JOSEPH	712 HILLDALE	ROYAL OAK	MI	48067	00005830492	148	51
383493759	BENNER, MICHAEL WILLIAM	90 KASEN COURT	PONTIAC	MI	48058	00003329598	148	52
363605152	BIBIK, FREDERICK PAUL	9385 MANDON RD	UNION LAKE	MI	48085	00003637068	148	4
370520127	BIENKOWSKI, JOHN ROBERT	2730 SYLVAN SHORES DR	PONTIAC	MICH	48054	00006811712	148	52
378186922	BIRAC, ELI	21219 SOUTHFIELD	SOUTHFIELD	MICH	48075	00003537058	148	4
363503279	BIRKHOLZ, ALLEN WAYNE	106 MASON CT	ROYAL OAK	MI	48067	00005843369	148	51
385509966	BLOOMINGDALE, ROBERT	8495 LINDA	WARREN	MI	48093	00005730256	148	3
374305451	BOLGER, FRANK BERNARD	42560 UTICA RD	STERLING HGTS	MI	48078	00000000000	148	51
375504670	BOGATAJ, DAVID FRANK	15776 REGINA	ALLEN PARK	MICH	48101	00003880003	148	52
367341025	BOHLER, RALPH JAMES	19832 WHITE OAKS	MT CLEMENS	MI	48043	00004650608	148	1
367509305	BRENION, DOUGLAS JOHN	9487 PATTON	LIVONIA	MI	48150	00004633313	148	52
375448769	BROWN, RICHARD MERRILL	7116 LOCKLIN	UNION LAKE	MI	48085	00003635064	148	52
365406746	BRUNER, JAMES WESLEY	806 W HOUSTONIA	ROYAL OAK	MI	48073	00005886425	148	52
362C29467	BRYDA, EVE SAVAGE	16532 WINTHROP	DETROIT	MI	48235	00000000000	148	55
368183602	BUDLONG, ROBERT W	24502 WARD	TAYLOR	MICH	48180	00002918532	148	52
372502291	BUGAMELLI, RALPH	8166 SAN MARCO	STERLING HTS	MI	48078	00002683324	148	3
136379699	BURGETTI, CAROLYN G M	1660 LINCOLNSHIRE DR	DETROIT	MICH	48203	00000930043	148	4
372464684	BURN, RONALD VINCENT BRZAKOWS	27927 PONCHARTRAIN	MT CLEMENS	MI	48043	00004641790	148	4
370582164	CALDWELL, KENNETH EDWARD	4433 CORNELL	DEARBORN HGTS	MI	48125	00005653118	148	4
382529763	CAPORALE, ERNEST D	86 EASTMAN	MT CLEMENS	MI	48043	00004653677	148	3
376528746	CARLSON, DOUGLAS HOWARD	11152 ROXBURY	DETROIT	MI	48224	00005279303	148	52
376629397	CARLSON, RICHARD WILLIAM	20210 BRADFORD	DETROIT	MI	48205	00005261928	148	1
381565853	CERANSK, EDWARD EDWARD	19589 GOULBURN	DETROIT	MI	48205	00005266743	148	3
384362613	CHALIFOUX, LEO M	7521 SMALE	WASHINGTON	MI	48094	00007815352	148	4
383525198	CHAPPELL, CHESTER A	2550 CALVERT	DETROIT	MI	48206	00008686158	148	3
571565429	CHELLAMMAL, DEVASAGAYAN	929-14 BEAL ST	CHARLOTTE	N C	28211	07043663439	148	1
376566536	CHERRY, THOMAS MICHAEL	22625 MILLENBACH	ST CLAIR SHORE	MI	48081	00002982336	148	52
368423358	CHIN, KAI LEE	5108 SHREWSBURY	TROY	MI	48084	00008791875	148	52
385347641	CLANCY, JAMES	8661 N DUTCHESS LN	BOYNO	MI	48065	00007528760	148	52
380446433	CLAY, DONALD HOWARD	36080 WINKLER	MT CLEMENS	MI	48043	00004680707	148	3
257244549	CLEMENTS, NATHANIEL P	17196 MUIRLAND	DETROIT	MICH	48221	00008613763	148	4
368323C75	COHEN, JERRY	1935 CHESTER RD	ROYAL OAK	MICH	48073	00005761885	148	57
378548244	COLBURN, DAVID WAYNE	32035 WILLIAMSBURG	ST CLAIR SHRS	MI	48082	00002937998	148	52

#EXECUTION BEGINS

CENSUS OF VAE STUDENTS AS OF 761

RANK	BED ACT	BED INACT	DED ACT	DED INACT	FLE ACT	FLE INACT	IED ACT	IED INACT	VOE ACT	VOE INACT	NO MAJOR ACT	NO MAJOR INACT	TOTAL ACT	TOTAL
FRESH	2	0	0	0	1	0	16	0	0	0	0	0	19	19
SOPH	8	0	1	0	3	0	8	0	0	0	0	0	20	20
JR	37	3	10	0	19	0	60	8	0	0	0	0	126	137
SR	35	0	8	0	32	0	78	0	0	0	0	0	153	153
MAT	34	5	16	2	19	0	18	1	0	0	0	0	87	95
SUBTOT	116	8	35	2	74	0	180	9	0	0	0	0	405	424
MED	124	10	21	0	89	8	107	3	0	46	1	0	342	409
SPECIALIST	3	0	4	0	0	0	1	0	0	9	0	0	8	17
DOCTOR	6	0	0	0	0	0	4	0	0	21	0	0	10	31
SUBTOT	133	10	25	0	89	8	112	3	0	76	1	0	360	457
POST BACH	1	0	0	0	5	0	4	0	0	0	14	0	24	24
POST MST	1	0	0	0	0	0	0	0	0	0	31	0	32	32
GUEST	0	0	0	0	0	0	0	0	0	0	14	0	14	14
SUBTOT	2	0	0	0	5	0	4	0	0	0	59	0	70	70
TOTAL	251	18	60	2	168	8	296	12	0	76	60	0	835	951

ACT: CLASS HAS BEEN TAKEN WITHIN PAST YEAR
INACT: CLASS HAS NOT BEEN TAKEN WITHIN PAST YEAR, BUT STUDENT WILL NOT BE REMOVED
FROM MASTER STUDENT FILE UNTIL HE HAS NOT TAKEN A CLASS FOR
TWO YEARS IF UNDERGRADUATE AND THREE YEARS IF GRADUATE

#EXECUTION TERMINATED
#

Next, there are a variety of student profile reports which are produced. The parameters for these reports include: admission date, sex, marital status, age, curriculum area, rank, honor point average, latest quarter enrolled, courses taken, courses not taken, courses listed in each student's plan of work, courses not listed in their plans, and expected graduation date. These parameters may be used in all possible combinations to obtain a variety of reports.

The profile reports serve many purposes. For example, each spring, professional organizations make awards to students with the highest scholastic achievement or entry to the organization is recommended based upon scholastic achievement. In the past, identification of eligible students consumed many hours. Now it takes but a matter of minutes. Another example involved a college on campus which decided to drop a course required by some VAE students. With the student data system, it was an easy task to identify those who had not yet taken the course and mail a letter to each student advising them of the change and the need to elect the course immediately. There are many other similar situations in which the student profile data was urgently needed.

Then there is a special kind of student profile data which is typically requested by the VAE Administrative Committee for use in making scheduling decisions. These reports include:

1. Average number of hours transferred in from other universities for each curriculum area and rank
2. Percentage of each group transferring in credit
3. Number of males and females by curriculum area and rank
4. Number of full- and part-time students in each curriculum area by rank
5. Marital status of students by curriculum area and rank
6. Average age of students by curriculum area and rank

One of the initial reasons for the VAE decision to computerize the Plan of Work data was to provide the faculty with enrollment projections. Upon demand, faculty can obtain a report citing the number of students scheduled to take each course each time it is offered for the following three years. It is even possible to get projected class lists. This report is updated bimonthly by the records secretary.

In order to keep the enrollment projections accurate, as well as to insure that students have an organized, sequential learning experience, it is important that students elect their professional courses in the sequence originally planned for them. Occasionally, students will bow to other pressures and decide to change the order or the quarter in which they elect courses. Acceptable changes are easy to make with a telephone

call. Unacceptable changes made on the student's own initiative are identified early each quarter when the computer compares each student's plan of work with the current class lists. Automatically, a letter is computer-generated and sent to each student not following the original plan. This letter notes the discrepancy and provides appropriate instructions. Thus, no faculty time need be spent in monitoring student programs from this point of view.

This part of the student data system which manages student census data is a relatively simple design. Data are obtained from the central university files as well as from students themselves when the plan of work is constructed. The data are stored and programs are written to generate computerized reports. The important tasks after the initial design are the updating of data and the prompt delivery of reports.

Student census data are beneficial to any teacher education program whether it be competency-based or not. The more complex and more crucial aspect of the student data system in terms of CBTE concepts is that facet which deals with student performance data.

Managing Student Performance Data

In competency-based programs, student performance is not measured course by course, but rather it is measured objective by objective or competency by competency. This smaller unit immediately demands more record keeping on the part of the faculty. Whether this becomes burdensome or not is dependent upon the design of the supporting data system. The records of student performance can be beneficial to faculty and students before instruction (to describe past performance in the program), during instruction (to describe current performance), and after instruction (to summarize the performance of a particular student, of an entire class, or of an entire curriculum area).

The strength of the student performance reports, however, is dependent upon the data which are reported by the faculty. In this part of the student data system faculty members have a choice of techniques used to collect and submit data. This decision determined the frequency with which the student performance reports are issued. There are two general methods faculty can use to report data:

1. By using the Objective Record Form (p. 31)

2. By using Optical Mark Recognition (OMR) Cards (p. 32)

The Objective Record Form is used by faculty who wish to accumulate the student performance data throughout the quarter and then receive only one report at the end of the quarter. Each faculty member who selects this technique automatically receives the form the second week of

TO KEYPUNCH OPERATOR
IF P IS CIRCLED, PLEASE PUNCH P IN THAT COLUMN. IF P IS NOT CIRCLED, PLEASE LEAVE THE COLUMN BLANK.
IF COLUMNS 1-9 ARE BLANK, DO NOT PUNCH ANYTHING FROM THAT LINE. IN COLUMNS 32-36, PLEASE PUNCH
NECESS ARY LEADING ZEROS. IF COLUMN 39 HAS THE WORD PASSED IN IT, DONOT PUNCH A CARD FOR THAT LINE.

TO FACULTY
IF SOCIAL SECURITY NUMBER IS MISSING, PLEASE ASK STUDENT FOR NUMBER AND WRITE IT IN THE APPROPRIATE
COLUMN. IF THERE ARE ANY VAE STUDENTS MISSING, ADD THEM AT THE BOTTOM. CROSS OUT ANY
WITHDRAWALS AND NON-VAE STUDENTS. DO NOT RECORD DATA FOR NON-VAE STUDENTS.

IF STUDENT PASSED THE EXEMPTION TEST, CIRCLE THE P IN THE APPROPRIATE COLUMN. YOU MAY USE THE
ADDITIONAL STUDENT DATA COLUMN ANY WAY YOU WISH. IF THE STUDENT HAS NOT PASSED THE EXEMPTION
TEST, IT IS ASSUMED THAT HE MUST GO THRU THE INSTRUCTIONAL PHASE AT LEAST ONCE. THE NO. OF
RECYCLES COLUMN REFERS TO THE NUMBER OF TIMES A STUDENT WENT THRU THE INSTRUCTION IN
ADDITION TO THE FIRST TIME.
WHEN THE STUDENT PASSES THE EXIT TEST, CIRCLE THE P IN THE APPROPRIATE COLUMN AND WRITE IN THE
YEAR (LAST TWO DIGITS OF YEAR, AND THE NUMBER OF THE MONTH). IF THE STUDENT WAS PASSED THE
OBJECTIVE PRIOR TO THIS QUARTER, PASSED IS PRINTED IN THE EXIT TEST COLUMN WITH THE DATE
WHEN IT WAS PASSED INDICATED.

VAE/RECORD SHEET FOR OBJECTIVE DATA
COURSE: 5191 SECTION: 17929
QUARTER: 741

SOCIAL SECURITY	NAME	OBJECTIVE NUMBER	EXEMPTION TEST	ADDITIONAL STUDENT DATA	NUMBER OF MINUTES TO COMPLETE OBJECTIVE	NUMBER OF RECYCLES	EXIT TEST	DATE PASSED (YR MO)	
CC 1-9	CC 10-25	CC 26-30	31		CC 32-36	37	38	39-42	43-51
385563050	ADAMUS, E THADDE	1001	P				P	/519117929	
"	"	1003	P				P	/519117929	
"	"	1004	P				P	/519117929	
"	"	1005	P				P	/519117929	
"	"	1007	P				P	/519117929	
"	"	1008	P				P	/519117929	
"	"	1009	P				P	/519117929	
"	"	1010	P				P	/519117929	
"	"	1011	P				P	/519117929	
"	"	1012	P				P	/519117929	
"	"	1014	P				P	/519117929	

NOTE ▶ COMPLETE INFORMATION ON REVERSE SIDE

SOC. SEC. NUMBER	COURSE	SECTION	OBJECTIVE NUMBER / KIT NO.	EXEMP FROM TEST PASSED	COMPLETION TIME IN MINUTES	NO. OF OBJECTIVES BEFORE KIT TEST PASSED	KIT TEST PASSED	DATE TEST PASSED YEAR / MO.
0 0 0 0 0 0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0	PASSED	0 0 0 0 0	0	PASSED	0 0
1 1 1 1 1 1 1 1 1	1 1 1 1	1 1 1 1 1	1 1 1 1 1	- []	1 1 1 1 1	1	[]	1 1
2 2 2 2 2 2 2 2 2	2 2 2 2	2 2 2 2 2	2 2 2 2 2		2 2 2 2	2		2
3 3 3 3 3 3 3 3 3	3 3 3 3	3 3 3 3 3	3 3 3 3 3		3 3 3 3	3		3
4 4 4 4 4 4 4 4 4	4 4 4 4	4 4 4 4 4	4 4 4 4 4		4 4 4 4	4		4
5 5 5 5 5 5 5 5 5	5 5 5 5	5 5 5 5 5	5 5 5 5 5		5 5 5 5	5		5
6 6 6 6 6 6 6 6 6	6 6 6 6	6 6 6 6 6	6 6 6 6 6		6 6 6 6	6		6
7 7 7 7 7 7 7 7 7	7 7 7 7	7 7 7 7 7	7 7 7 7 7		7 7 7 7	7		7
8 8 8 8 8 8 8 8 8	8 8 8 8	8 8 8 8 8	8 8 8 8 8		8 8 8 8	8		8
9 9 9 9 9 9 9 9 9	9 9 9 9	9 9 9 9 9	9 9 9 9 9		9 9 9 9	9		9

40

classes.[5] This form displays a chart with space for the following information for each student: the performance objective number, whether the objective was passed on the exemption test, the amount of time required to achieve the performance objective, the number of recycles, whether the exit test was passed, and the date it was passed. To complete this form during the quarter, the faculty members merely circle one letter and write two to three numbers for each performance objective per student. These data are entered into the system by keypunching directly from the form at the end of the quarter.

The OMR card is used, on the other hand, by faculty who would like to receive student performance reports periodically throughout the quarter. The frequency of reports depends upon the frequency of submission of the cards. It would be possible for faculty to receive weekly status reports. This card is the typical arrangement used for direct computer entry. Faculty (or students) blacken spaces which represent the same information that was described on the Objective Record Form. Each student completes one card for each performance objective.

In both methods of reporting student performance data, faculty clerical time was kept at an absolute minimum. However, in either case, the completeness and the clarity of the data determine the completeness and the accuracy of subsequent reports. Either process provides the same reports. These reports include the transcript, the history report, the student status reports, the student letter, and the analyses of performance objective data.

The transcript, while not an official transcript from the registrar's office, does contain all of the same information as do traditional transcripts. These are updated quarterly and are available to any faculty member who requests them. Although faculty could receive a printout with the transcripts for all students in their curriculum area, most refer to a copy on file with the records secretary. Another commonly used technique is to request the transcript of an individual in advance of a conference.

Of immediate interest to many faculty is the History Report for their new class. This report is available upon request the second week of the quarter. For a given course, this report lists all students enrolled in the course, and provides the following information for each student: the performance objectives which should have been completed to date (those performance objectives which are directly prerequisite to the current course are starred), the number of recycles, and the date each objective was passed. This report provides diagnostic information which can be used

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[5]These forms are computer generated in the following manner. First, using input from the university registration magnetic tapes, class lists are produced. The Objective Record Form is constructed through a combination of the class list and data from the Course Objective Parameter File. This file contains the following information for each objective in the program: performance objective number; course where taught; where tested (campus or field); module in which objective is taught; if any, prerequisite objectives; competencies to which objective is matched; and a brief description.

throughout the quarter.

The status reports give both students and faculty an up-to-date record of their progress in the course at hand. If the instructor used the OMR cards, these reports are generated periodically throughout the quarter. For example, this procedure is always followed in Intern Teaching. The status report includes the following information for each student: the performance objectives for that class, an indication of an objective not passed, the number of recycles, and the date passed. Assuming that instructors manage the course so that students are progressing at different rates, they need these reports in order to know exactly which students have achieved which performance objectives.

At the end of each quarter two special types of status reports are issued, one to the student and another to the curriculum area faculty. The student is sent a letter which again reviews his records, detailing which performance objectives are recorded as passed and the date of completion. If there are any special difficulties, special messages are printed providing some advice; all students get directions for the next steps to take. This report not only keeps students informed but also provides a check to insure that all of the recorded data are correct.

Next, the curriculum area faculty receives a status report of all of their students. For example, the Family Life Education Curriculum Coordinator would receive this report, and, with the rest of the faculty in that area, could review the overall progress of their students. Problem students are flagged on this report. Problems might include, for example, that there are students who have not completed all of the performance objectives to date. Thus, the faculty can identify students who should be contacted for a conference or students who should be given special consideration in the next course. This example indicates another instance in which the computer-generated data do, in fact, provide a means by which the students can receive more attention than they might have if they were in a program not supported by a student data system.

Finally, at the end of each quarter, the faculty member receives summary data of the performances in his/her course that can provide the basis of revision of the delivery system or even the revision of a performance objective in that course. These data are histograms showing the variation per performance objective in that course and, in terms of the number of recycles, the number of students passing the exemption and exit tests, and the amount of work time.

The student data system, as described thus far, encompasses only the time a given student is in the program. However, much of these same data (both census and performance) are stored and combined with other student reactions for later use in program evaluation. Establishing some systematic procedures for evaluating and revising programs is an important facet of competency-based education. Without this feedback, one could not hope for programs which would continually improve and change to meet the changing needs of learners and of society.

Students complete a Content Evaluation Form in which the following questions are asked in terms of each performance objective in the course:

1. Did the prerequisite course, if any, give you an adequate foundation in meeting this objective?

2. Were adequate time, materials, and facilities provided for you to achieve this objective?

3. How meaningful were the assignments in relation to the mastery of this objective?

4. How meaningful were the methods (modules, films, etc.) used in conveying the instruction to master this objective?

5. Did the exit test accurately measure the behavior sought in this objective?

6. Do you feel you have really mastered this objective?

7. In hindsight, do you think you could have passed the exemption test on this objective at the beginning of the quarter without receiving instruction?

8. Do you feel this objective is essential to your teaching preparation?

The student need only circle a phrase from a choice of answers to each question.

On the basis of these answers and previously collected student census data and student performance data, it is possible to answer program evaluation questions such as the examples which follow:

1. Is there a change over a period of time in the demographic and academic characteristics of students when they enter the VAE program?

2. Is there any change in characteristics of dropouts and reasons for dropouts over a period of time?

3. What is the relationship between achievement on the intern teaching examination and achievement in prior professional courses?

4. What is the percentage of increase/decrease in actual enrollment vs. projected enrollment?[6]

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[6]Charlotte Neuhauser, "The Design and Implementation of a Management Information System to Facilitate the Functioning of a CBTE Program", a paper presented at the annual meeting of the American Educational Research Association in Chicago, 1974, Appendix J.

5. What is the span of time which occurs between passing a test for a given performance objective and not passing that same test item when it becomes a prerequisite skill test item for a subsequent course?

6. Which performance objectives are actually needed in terms of student perceptions and student performance?

These are but a few of the evaluation questions which could be answered as a result of the student data system. But, they do represent the scope of decisions that could be made with the information collected.

Analysis and Conclusions

The VAE student data system has some distinct advantages and some weaknesses. First, the student census facet has two major advantages:

1. It saves professional time which previously had been put into paperwork, thus allowing more time for actual student contact.

2. It provides a factual base upon which decisions can be made.

There is little controversy attached to this part of the system, and in some cases the availability of data avoids controversy.

The student performance aspect provides the detailed information needed in competency-based programs with a minimum of faculty effort. Furthermore, it provides a wealth of information for use in diagnosis of students and further course and program planning. Students are aware of their exact status and of their own records.

However, there are some problems with the student performance system. First, the system is worthless unless every faculty member submits complete, accurate data. And while these data are relatively simple to submit, new habits must be formed, and this is sometimes difficult. As with many changes, some persons quickly use the new information and come to rely on it. Others, doubting its credibility, are reluctant to fully utilize such information. Still others may even fear the change process because of the potential of evaluation implications.

Perhaps the greatest weakness of the entire system is the lack of mathematical model on which decisions can be made based upon the data. Rules and processes should be devised so that changes and decisions can be easily formulated. This is especially crucial in terms of program evaluation, because the very extensiveness of the data can create confusion and not always lead to clear, logical, and quick decisions.

A major advantage and strength of the entire student data system

is the method of data retrieval. The reports are now typically generated by a student records secretary, a person who came to the job with no special computer training, but who is operating the system using the documentation manual as a guide. Furthermore, each VAE faculty member can obtain a sign on number and generate his or her own reports. This is indeed an advantage at a time when education budgets are dwindling and almost every service must be viewed as one which could be dispensed with. The faculty itself could continue to have access to the reports.

However, one of the greatest benefits of this data management design is that the VAE students have received more expert guidance and more attention than they typically did under the traditional approach. Once an individual's program has been designed, the student and faculty no longer need spend their time on the routine. Now time can be spent solving the problems, exploring new ideas, and providing career counseling.

APPENDIX

A Summary of Data Collected

Name
Address
Telephone number
Social Security number
Rank
Curriculum area
Sex
Marital status
Birth date
Date of admission to university
Quarter admitted to VAE
Graduate/undergraduate status
Senior college
Residency status
Expected graduation date

For each VAE course scheduled:
- Course number
- Quarter expected to take course
- Year expected to take course

Student Performance per Objective:
- Passed on Exemption Test
- Number of recycles
- Minutes of work time
- Passed on Exit Test
- Date passed

Date VAE Plan of Work Made or Revised
New or revised Plan of Work on record
Cumulative honor point total
Cumulative resident hours
Cumulative honor point base
For each course taken
- Quarter and year course taken
- Section number
- Grade received
- Withdrawal code
- Graduate/undergraduate code
- Credit hours
- Length of course in weeks
- Course number

For each VAE Performance Objective:
- Performance objective number
- Course where taught
- Where tested (field or campus)?
- Module in which objective is taught
- Prerequisite objectives
- Competencies to which objective is matched
- Brief description of objective

A Summary of Reports

CENSUS DATA REPORTS

Alphabetical listing of students (5th week of quarter)
Census of VAE Students (quarterly)
Profile Reports--any combination of 13 paramets (issued upon request)
Class Counts by Quarter and Year (Projected enrollment, issued upon request)
Computer Letter to Students (Issued quarterly to those students not following Plan of Work)

PERFORMANCE DATA REPORTS

Student transcript (one copy by 3rd week of quarter and upon request)
History Report (2nd week of quarter by request)
Course Status Report (end of quarter or upon request)
Curriculum Status Report (end of quarter)
Student Status Letter (end of quarter)
Number of Students Needing Recycles Before Passing Objective (end of quarter)
Number of Students Passing Exemption and Exit Test (end of quarter)
Number of Students and Length of Time to Complete Objective (end of quarter upon request)

PROFILING AND TRACKING STUDENTS THROUGH THE UTILIZATION OF A COMPUTERIZED INFORMATION SYSTEM

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Introduction

Keeping records is a process with which all of us are familiar. Included in the process are approaches ranging from simple and informal records stored in the memory of a child to highly complex and formal records kept in the memory banks of large computers. If the amount of information to be recorded is small (say to keep track of the expenditure of a 50¢ allowance) and the way in which the information is to be used is very simple and straightforward (perhaps to justify a requested increase in one's allowance), then the child's memory may be all that is necessary. However, if there is a great deal of information to be processed (say all of the transactions of a large corporation such as General Motors) and the way in which the data are to be used is extremely complex and multifaceted (as to manage the corporation in a manner that promotes healthy growth and consumer confidence), then a systematic approach that takes advantage of all of the latest technological innovations is essential.

The type of records required in our country during the early days of teacher education resembles the first situation cited above in that they did not require much beyond simple memory. The information to be recorded was minimal, e.g. the courses one had completed and the grades one had earned. Furthermore, the use to which the information was put usually served only one to two purposes, namely to recommend one for a degree and perhaps a certificate. Neither the individual professors nor their institutions had to justify their actions to the public to any great degree.

Problem

Teacher education today, like society, is far more complex than it was in the past. The elements to be recorded and the use to which they are to be put resemble those encountered by a large competitive corporation a great deal more than they do a youngster's attempt to justify an increase in allowance. Most of the old elements are still present, but now many more demands are placed on the system. With the advent of CBTE throughout the nation, educators are faced with many new information problems. Not only is there a growing demand (especially in mastery oriented programs such as PBTE and CBTE) for data on separate elements, there is also a desire to know far more about the courses and elements than simply whether the student "passed" and, if so, at what "normative" level.

Financial exigency and public demand for accountability make it increasingly necessary to be able to analyze the cost-effectiveness of a given program. Unlike the not-too-distant past where resources were available in abundance to support educational innovations, seed money is now very scarce. Before the public is willing to invest in an educational experiment, they want some guarantee that sufficient and appropriate data will be generated and analyzed throughout the proposed program to yield information useful in formative as well as summative evaluation.

Because, in a teacher education program, student progress and success upon completion are the major factors of importance, it follows that the

more information available on their achievements the more likely one is to be able to help them become effective teachers. Gentry[1] points out that teacher, administrator, and student opinions alone are no longer adequate to determine whether a learner has reached competence in a particular knowledge, skill, or understanding. The implication is that a sizable body of readily available objective data is needed. At this point, we are not concerned so much with the kind of data as we are with the amount of data involved and with the realization that a precise system must be evolved if use of the data is to be at the maximum practical level. Two central questions arise in this regard: 1) How is the mass of data to be organized? 2) How is the system to be maintained effectively?

One might assume at first thought that all that is required is a more sophisticated paper and pencil system. Add a few columns to the grade book, color code selected elements, evaluate more frequently, and you are on your way. In fact, this is not too far from what many PBTE/CBTE programs d[illegible]initially. Many of the systems were surprisingly effective--at first. How[illegible] as the amount of data increased and the uses to which it was put ex[illegible], it became increasingly evident, as Gentry put it, that it would s[illegible] not be practical to handle manually the vast amount of data generated by a CBTE program.

Solution

According to Sir Leon Bagrit,[2] a noted British manufacturer of computers, the greatest change in the whole history of mankind is automation. It would seem logical that the most viable alternative to the paper and pencil approach to profiling and tracking students in a CBTE program is some form of automation. The utilization of computer technology, one of the most advanced forms of automation, has much to offer in this whole area of record keeping for CBTE programs.

As a solution to the general problems already mentioned, as well as program-specific questions, the College of Education at The University of Texas at El Paso developed an information system. The term "system" as used in this paper, refers to a comprehensive and complex unity of separate elements of subsystems that all function in a systemic manner in keeping with an overall plan designed to provide data on a systematic basis concerning students, instructors, instructional materials, programs, facilities, and ancillary operations within the college.

At the heart of the system is the computerized Student Information Systems Package (SISP). This subsystem was developed as a part of the Southwest Texas Local Cooperative Teacher Education Center (STLCTEC) efforts with financial support provided in the form of a grant from the Texas Center for the Improvement of Educational Systems (TCIES). It was designed primarily to create permanent file records (profiling) and to monitor (tracking) student progress.

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[1]Gentry, Cass, and others. "For Want of an Assessment System, CBTE Programs are Lost," PBTE 3-3 (September, 1974), 1-2, 8-11.

[2]Bagrit, Sir Leon. The New York Times, March 17, 1965.

Included in this paper is a brief history of the origins of the total system, the services it provides, its operational elements, the information generated by it, and specific information concerning its adaptation and utilization at other sites. The final section of the paper deals with some additional applications of information systems in general, and subsystems like SISP, in particular.

System Description and Applications

The system, in its most current form, is specifically designed for use with a competency-based program. It includes separate subsystems that provide a variety of data ranging from information on facility utilization and materials effectiveness to profiling and tracking information on individual students. Profile data include basic information about the student as well as data related to competencies achieved throughout the program. Tracking reports, provided on a weekly basis, indicate student progress and work remaining to be attempted.

Historial Development

The efforts that resulted in a need for a sophisticated information system began in 1970 when the college became involved with the TTT program. In the process of gearing up for implementation of a pilot effort, it became apparent that the normal paper and pencil information processing techniques would not work. As a result, a computerized system for processing information was designed primarily by Dr. Ronald Kidd and Mr. Bennie Spencer. As the demands on the system increased, it became evident that revisions were necessary in order to make the system more flexible and less difficult to use by minimally trained personnel.

Extensive revision of the system, under the direction of Dr. Stanley Ball, began in 1973. In addition to considerable computer program rewrites, the entire system was converted from a CDC 3000 to an IBM 360 computer. From its rather modest start in 1972, the present system has increased its capacity until it now has the capability of serving the entire college.

Services Provided

As has been indicated, the comprehensive information system serving the college provides multiple services including data on module storage, materials circulation, student profiles and progress, comprehensive analysis of selected data, and items relating to the overall efficiency of various ancillary operations such as the duplication center and the microteaching laboratories. All of this information serves as valuable input to the decision-making process concerning total program operations within the college.

The SISP subsystem provides for the recording of information related to individual students, as well as groups of students, and the competencies they have achieved. At present, the system described herein is handling approximately 4,500 transactions with students per semester. A cumulative total (Fall 1973 through Spring 1975) is approximately 30,000 transactions.

As indicated by Ball,[3] information collected by SISP includes: a) dates materials were checked in and out, b) dates that posttests were completed, c) results of evaluations including numbers of attempts or recycles, d) time utilized for completion of material, e) facilities utilized, f) alternatives selected and g) person completing the evaluation. The SISP is designed to organize information into a format that makes it possible to generate reports dealing with questions concerning student progress and permanent file maintenance.

Operational Elements

In order to provide the above services, the various parts of the system must necessarily be working together in an efficient and effective manner. The elements that make up the system, as well as some of their interactions, are presented below. A full description of operational elements in the system includes: 1) the physical aspects such as locations of rooms housing materials and the computer and the various laboratories used in the CBTE program, 2) the personnel involved in carrying out the functions of the system, and 3) the computer components such as the computer programs and card decks. Even though the discussion which follows applies specifically to the system as it is being operated in the College of Education at U.T. El Paso, the authors believe that the material is generalizable to most any program operating under similar conditions. Students and faculty involved in the CBTE program have found the system very helpful in providing data necessary for consistent and rational decision making.

Physical. A primary physical aspect is the central control facility located within the Learning Resource Center (LRC) in the Education Building. In this facility, known as the Module Control Room, are found all of the modules which students check in and out, some of the learning packages which students use, files for the Post Module Inventory sheets, posttests for various competencies, as well as various materials such as computer card files, computer logs, and computer printouts which are essential for the management of the computer file. Usually the Computer Coordinator is officed in this room.

The Learning Resources Center also contains the various laboratories which are utilized for specific components of the CBTE efforts, the library, and an audiovisual production center. Various activities take place in the different locations depending on the needs of students, faculty, and staff.

The computer, an IBM 360/50, which is used for this system is housed in another building and serves the entire campus. The programmer, who aids the College of Education, has his office there and all of the keypunching is done in that building. The system makes use of several magnetic tapes for storage and those tapes are kept in that same building.

Personnel. The overall integration of the logistics and personnel for the system is the task of the Learning Resources Coordinator. This person is of nonprofessorial rank and is responsible directly to the

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[3]Ball, Stanley. "Student Information Systems Package." El Paso, Texas: The University of Texas at El Paso with the Texas Center for the Improvement of Educational Systems, 1974. (Mimeographed).

Assistant Dean of the College of Education. His role is essentially that of business manager.

The information system serves a program which contains three main cores: Professional-Technical, Psycho-Personal, and Socio-Cultural. Each of these cores has a laboratory which is located in the Learning Resources Center. Furthermore, each of the cores has a Core Director who is of professorial rank and has the task of developing the organization within the core. This arrangement provides the maximum usefulness to the overall objectives of the college.

The Director of Information Systems, also of professorial rank, is one who is familiar with the logistics of the management system as well as the computer elements so that he can oversee the operations concerning the computer file maintenance. Working for this director is the Computer Coordinator who performs such tasks as punching computer cards, running computer programs, checking printouts, diagnosing errors, and interaction with computer programmers and operators. The Computer Coordinator is usually a part-time student paid on an hourly basis. There are various other keypunchers and clerks who are necessary for collecting information and putting it into a format which makes it conducive to computer manipulation. Lastly, there is a Computer Programmer, who is knowledgeable about the specific computer language used in the computer programs and who is available for debugging errors and making program changes when necessary.

Computer. The following several paragraphs describe the various computer components which are necessary for the large information collection and organizational task so vital to the success of the overall system. The elements discussed here form the core of SISP which has been fully documented elsewhere.[4]

All of the computer elements are designed to interact in some way with a rather large computer file which is the central brain of the system. This file, which is kept on magnetic tapes in the Computer Center, is updated daily with the information that has been collected at the Module Control Room. At least once a week, requests are made that the file give information on the progress of students as they proceed through the CBTE program. The information contained on this file includes student name, student social security number, module progress information, student biographical information, and course identification. This information is coded and entered onto the file according to course identification and student social security number.

Computer programs provide for entering information onto this file and for manipulating the information. The rather elaborate programs, written in COBOL, perform basically two kinds of functions: file maintenance and report generation. First, there is a program which generates the cards used in the Module Control Room. These cards contain the information which is placed onto the file. Another program adds information

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[4]Ball, Stanley, op. cit.

to the file or deletes and replaces information in case of errors. File maintenance is a daily operation and is the primary responsibility of the Computer Coordinator. The second major function of the two other computer programs is that of generating reports which are used throughout the system. One of these programs writes the report which lists the competencies attained by students within courses. The other program produces a report called a profile which lists competencies completed by students across courses. These reports are discussed in greater detail in the next section of this paper.

It was necessary to devise some system whereby the large number of computer cards could be kept organized and orderly but yet still be accessible in the Module Control Room. There were cards which were not used often, others which were being keypunched quite often, and yet others which were full and were not to be used again. Therefore, it seemed reasonable to consider three such files for cards: 1) an Inactive File for the cards on students who had not yet begun their competency-based program, 2) an Active File for those presently pursuing modules in one of the laboratories, and 3) a Completed File for those competencies which were completed by specific students.

There are two other computer components which are important to the overall system but which are not part of the SISP subsystem. First, there are two decks of cards which are punched from information collected from the students: student biographical information collected at the beginning of each semester, and information which is keypunched from the Post Module Inventory Forms which will be further discussed in the next section. Secondly, programs which already exist in the Computer Center are used to aid our statistical analysis of data.

Information Generated

The information system used in the College of Education requires the collection and manipulation of a large amount of information. This section of the paper deals with information organization and flow. As previously mentioned, most of the information collected from and about students is kept on magnetic tape in the Computer Center. Other information in the form of punched computer cards and computer printouts is stored in the Module Control Room. The entire body of information is discussed here in two large groupings: 1) input and 2) output.

Input. Input information is that information received from or about individual students and their activities within the program, most of which appears explicitly on the computer file. In order for a student's name to appear properly on the computer file, it is necessary for him to have filled out a Student Information Form (See Exhibit #1, p. 46). This form collects biographical information such as social security number, teaching fields, grade point average, the college in which the student is enrolled, mailing address, and birthdate. These forms are keypunched onto computer cards and entered onto the computer file.

The largest body of information that is collected in this system consists of module progress information. As the students come to the Module Control Room, data are collected which relate to completed

Exhibit #1

COLLEGE OF EDUCATION
STUDENT INFORMATION FORM

SEMESTER_____ DATE_____

COURSE:

DEPT._____ NUMBER_____ SECTION_____
7 11 15

COURSE CODE_____
77

NAME_____
17 LAST FIRST MIDDLE

SOCIAL SECURITY_____
37

SEX: MALE_____ FEMALE_____
46 46

DATE OF BIRTH:_____
Month 47 Day Year

TOTAL CREDIT HOURS EARNED:_____
53

GRADE POINT AVERAGE_____
56

SCHOOL IN WHICH ENROLLED:_____
59

TEACHING FIELDS:

1._____ _____
64 Literal Code 68 Numeric Code

2._____ _____ _____
70 74 Code

LOCAL ADDRESS:_____

_____

TELEPHONE:_____

FORM SIF-1
01/08/73

competencies. These data include the student's name and social security number, course and module identification, learning alternative selected, attempt number, laboratory facility used, dates for the times the module was started and finished, time spent on the module, posttest evaluation result, a code indicating whether or not the module was required or optional, and a code for the person evaluating the posttest. All of this information is punched onto one computer card and is added to other information that the student has on the computer file.

At the time that each student goes to the Module Control Room to check out a module, he is handed a Post Module Inventory (See Exhibit #2, p. 48) which he fills out at the completion of the module and returns to the Module Control Room. This inventory gives the student an opportunity to react to the module and/or the learning alternative selected to pursue in that module. There are several areas which this inventory taps, such as the interaction with instructors or laboratory assistants, the relevance of this module to particular areas of interest, the clarity of objectives, and fairness of the posttest. As with all of the input data, this information is also punched onto computer cards and used in the generation of reports and summary statistics during periodic evaluations.

Output. Output information is that which is generated from the input in the form of reports or statistical summaries. It is designed to serve the students and faculty of the College of Education. It takes the form of reports and computer printouts which are posted and circulated to the various interested parties. These reports are produced by the week, month, or semester depending on the use to be made of them. The following paragraphs discuss these different reports individually.

There is an intermediate daily report which is useful only to the computer coordinator and is used to check for errors. The computer cards are delivered daily to the Computer Center to update the computer file. There is a need to keep checking these records often in order that errors do not compound themselves.

On a weekly basis a module progress computer printout is prepared (See Exhibit #3, p. 49). This report contains the information collected regarding the student's completion of competencies by way of specific modules, including module and course identification, posttest evaluation results, laboratory time used, and other information as seen on the exhibit. These computer printouts are organized so that they are posted in the Learning Resources Center by course and pertain to the current semester only. In this way students and faculty can see the progress of students as far as specific courses are concerned. Also students can check to see that there have been no errors. These printouts are used by many instructors near the end of the semester to aid in their counseling of students about enrollment for the following semester.

Once a month a report which is similar to the above is produced. This time the report is cumulative in nature in that it prints out student progress within all of the courses that have been entered onto the file. This report serves the purpose of indicating a student's progress in courses in which he was previously enrolled but has not yet finished. The CBTE program on our campus allows students to work at their own rate. Therefore,

EXHIBIT #2

CBTE
POST MODULE INVENTORY

Module #_____ Date_____

1. The purposes and objectives of this module were made clear and definite.

completely agree	agree	undecided	disagree	completely disagree
1	2	3	4	5

2. The assignments, requirements and examinations given were appropriate and directly related to the purposes and objectives of the module.

completely agree	agree	undecided	disagree	completely disagree
1	2	3	4	5

3. The module was clear, thorough, and stimulating.

completely agree	agree	undecided	disagree	completely disagree
1	2	3	4	5

4. I was successful in making this module relevant to my area of interest.

completely agree	agree	undecided	disagree	completely disagree
1	2	3	4	5

5. I felt I learned a lot from this module.

completely agree	agree	undecided	disagree	completely disagree
1	2	3	4	5

6. The readiness (post) test was a fair and impartial evaluation of what the module required me to do.

completely agree	agree	undecided	disagree	completely disagree
1	2	3	4	5

7. In working on this module my interactions with proctors, graduate assistants and the instructor were helpful.

completely agree	agree	undecided	disagree	completely disagree
1	2	3	4	5

8. Estimate how much time you spent on the module out of the Labs.

9. If you were to improve anything associated with this module, briefly describe what it would be and how you would do it.

10. General comments:

EXHIBIT 3

GUID 3310-04 KIDD RONALD PSYC OF SEC STUDENTS CUMULATIVE 06/13/75

NAME		SOC. SEC. NO	SEX	SCHOOL	TEACHING FIELDS FIRST	SECOND
PHILLIPS	CE	227-52-3732	M	LA 2	MATH12	PHYS13

MODULE ID	ATT	DATE START	ALT	DATE REQ COMP	DATE TEST COMP	RLT	LAB TIME	LAB FAC
02:A-09	1	090572	1	090772	090772	1	1.0	B
02:A-10	1	090572	1	091272	091272	2		
02:A-10	2	091272	9	091272	091272	1	1.0	B
02:A-11	1	091272	1	091372	091372	1	1.0	B
02:A-12	1	091372	1	091472	091472	1	1.5	B
02:A-13	1	091472	1	091572	091572	1	1.0	B
02:A-14	1	091572	1	091872	091872	2		
02:A-14	2	091872	9	091872	091872	1	1.0	B
02:A-15	1	091872	1	091972	091972	1	1.0	B
02:A-16	1	091972	1	092072	092072	1	1.0	B
02:A-17	1	092072	1	100672	100672	1	1.0	B
02:A-18	1	100672	1	102472	102472	1	.5	B

MODULES NOT ATTEMPTED

02:B-01 02:B-02 02:B-14 02:B-15 02:B-16

NAME		SOC. SEC. NO	SEX	SCHOOL	TEACHING FIELDS FIRST	SECOND
PETERSON	KL	362-42-8651	M	LA 2	H PHCS	SCI 19

MODULE ID	ATT	DATE START	ALT	DATE REQ COMP	DATE TEST COMP	RLT	LAB TIME	LAB FAC
02:A-09	1	090572	1					

MODULES NOT ATTEMPTED

02:A-10 02:A-11 02:A-12 02:A-13 02:A-14 02:A-15 02:A-16
02:A-17 02:A-18 02:B-01 02:B-02 02:B-14 02:B-15 02:B-16

NAME		SOC. SEC. NO	SEX	SCHOOL	TEACHING FIELDS FIRST	SECOND
PARRISH	FH	449-74-9044	M	EDLC1	BISC01	GECLC6

MODULE ID	ATT	DATE START	ALT	DATE REQ COMP	DATE TEST COMP	RLT	LAB TIME	LAB FAC
02:B-01	1	090772	1					

MODULES NOT ATTEMPTED

02:A-09 02:A-10 02:A-11 02:A-12 02:A-13 02:A-14 02:A-15
02:A-16 02:A-17 02:A-18 02:B-02 02:B-14 02:B-15 02:B-16

NAME		SOC. SEC. NO	SEX	SCHOOL	TEACHING FIELDS FIRST	SECOND
GUTIERREZ	C	452-46-0084	M	EDLC1	ENGLC5	H PHC9

MODULE ID	ATT	DATE START	ALT	DATE REQ COMP	DATE TEST COMP	RLT	LAB TIME	LAB FAC
02:A-09	1	090572	1	091972	091972	2		
02:A-09	2	091972	9	091972	091972	1	1.0	B
02:A-10	1	102972	1					

MODULES NOT ATTEMPTED

02:A-11 02:A-12 02:A-13 02:A-14 02:A-15 02:A-16 02:A-17
02:A-18 02:B-01 02:B-02 02:B-14 02:B-15 02:B-16

NAME		SOC. SEC. NO	SEX	SCHOOL	TEACHING FIELDS FIRST	SECOND
VALENCIA	JL	453-72-1624	M	EDLC1	BISC01	H PHC9

MODULE ID	ATT	DATE START	ALT	DATE REQ COMP	DATE TEST COMP	RLT	LAB TIME	LAB FAC
02:A-09	1	090572	1	101872	101872	1	.7	B
02:A-10	1	101872	1	102572	102672	1	1.0	B
02:A-11	1	102672	1					

MODULES NOT ATTEMPTED

02:A-12 02:A-13 02:A-14 02:A-15 02:A-16 02:A-17 02:A-18
02:B-01 02:B-02 02:B-14 02:B-15 02:B-16

NAME		SOC. SEC. NO	SEX	SCHOOL	TEACHING FIELDS FIRST	SECOND
BILLINGSLEA	JR	454-96-1542	M	BLSN5	BLSN18	ACAE26

MODULE ID	ATT	DATE START	ALT	DATE REQ COMP	DATE TEST COMP	RLT	LAB TIME	LAB FAC
02:A-09	1	090572	1	102572	102572	1	.2	B
02:A-10	1	102572	1	110172	110172	1	1.2	B
02:A-11	1	110172	1	110672	110672	1	1.5	B
02:A-12	1	110672	1	110872	110872	1	1.0	B
02:A-13	1	110872	1	111572	111572	1	1.5	B
02:A-14	1	111572	1	120172	120172	1	1.5	B

EXHIBIT 4

THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF EDUCATION

STUDENT PROFILE
COMPETENCY-BASED TEACHER EDUCATION

STUDENT NAME	SS NO.	SEX	DATE OF BIRTH	CREDIT HOURS	GRADE POINT	SCHOOL	TEACHING FIELDS
Y DON H	554-36-7124	-	-				

CRS/SEC CODE YR/S DEPT. INSTRUCTOR — COURSE TITLE

3000-00 73 A AOCURR KLINGSTEDT — GENERAL MODULE USAGE FALL SEM 73

MODULE	ATTEMT	DATE STARTED	ALTER-NATIVE	DATE RETURNED	DATE OF RESULT	RESULT	LAB	FAC EVAL	OPT
02:A-17	1	10-19-73	1	10-22-73	10-22-73	1	1.0	R	

CRS/SEC CODE YR/S DEPT. INSTRUCTOR — COURSE TITLE

3311-03 2435 73 A AOCURR BARKER — INTRO SEC CURR FALL SEM 73

MODULE	ATTEMT	DATE STARTED	ALTER-NATIVE	DATE RETURNED	DATE OF RESULT	RESULT	LAB	FAC EVAL	OPT
01:B-01	2	12-03-73	1	12-04-73	12-04-73	1		A	
01:B-01	1	11-27-73	1	11-27-73	11-27-73	2		A	
01:B-02	1	11-15-73	1	11-16-73	11-15-73	1		A	
01:B-07	1	11-06-73	1	11-13-73	11-13-73	1	.5	A	
01:C-03	1	10-09-73	2	10-16-73	10-16-73	2	.5	A	
01:C-05	1	11-13-73	1	11-14-73	11-14-73	1		A	
01:D-01	1	10-30-73	1	10-30-73	10-30-73	1	1.0	A	
01:D-05	1	11-02-73	1	11-02-73	11-02-73	1		A	

CRS/SEC CODE YR/S DEPT. INSTRUCTOR — COURSE TITLE

3311-04 2417 73 A AOCURR HALL — INTRO SEC CURR FALL SEM 73

MODULE	ATTEMT	DATE STARTED	ALTER-NATIVE	DATE RETURNED	DATE OF RESULT	RESULT	LAB	FAC EVAL	OPT
01:C-02	2	10-16-73	2	10-23-73	10-23-73	1	1.0	A	
01:C-03	1	10-22-73	1	10-30-73	10-30-73	1	1.0	A	
02:A-10	1	09-21-73	1	09-25-73	09-25-73	1	.5	R	
2 : -	2	10-16-73	2	10-23-73	10-23-73	1	1.0	A	

CRS/SEC CODE YR/S DEPT. INSTRUCTOR — COURSE TITLE

3310-04 4477 73 A AOGUID SLETTEDAHL — PSYC OF SEC SCH STU FALL SEM 73

MODULE	ATTEMT	DATE STARTED	ALTER-NATIVE	DATE RETURNED	DATE OF RESULT	RESULT	LAB	FAC EVAL	OPT
02:A-10	1	09-13-73	1	10-05-73	10-05-73	1	1.0	R	
02:A-14	1	10-10-73	1	10-11-73	10-11-73	1	.5	R	
02:A-15	1	10-11-73	2	10-16-73	10-16-73	1	1.0	R	
02:A-16	1	10-16-73	1	10-18-73	10-18-73	1	1.0	R	
02:A-17	1	10-19-73	1	10-23-73	10-23-73	1	1.0	R	
02:A-18	1	10-23-73	1	10-25-73	10-25-73	1	1.0	R	

EXHIBIT 5

*** OUTPUT FROM PROGRAM DISTAT ***

STAT FOR MODULE 01005

PARAMETERS
COL 1- 5 = 14
COL 6-10 = 51
COL 11-15 = -0
COL 16-20 = -0
COL 21-25 = 1

DATA FORMAT = (20x,14F1.0)

OPTIONS = 1 1 1 1 1 1 1 1 1 1 1 1 1 1

VARIABLE 1		MEAN =	1.1961
SIGMA =	.5247	STD.DEV. =	.5299
SIGMA(M) =	.0735	S.D.(M) =	.0742
SUM X =	61.0000	SUM X2 =	87.0000
SKEWNESS =	7.6616 (P = .0000)		
KURTOSIS =	8.2642 (P = .0000)		
N VALID SCORES =	51.		

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD
1.0000	44	86	43	46
2.0000	4	8	90	65
3.0000	3	6	97	84

VARIABLE 2		MEAN =	1.0244
SIGMA =	.1543	STD.DEV. =	.1562
SIGMA(M) =	.0241	S.D.(M) =	.0244
SUM X =	42.0000	SUM X2 =	44.0000
SKEWNESS =	16.1195 (P = .0000)		
KURTOSIS =	47.0858 (P = .0000)		
N VALID SCORES =	41.		

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD
1.0000	40	98	49	48
2.0000	1	2	99	99

VARIABLE 3		MEAN =	1.4706
SIGMA =	.7759	STD.DEV. =	.7837
SIGMA(M) =	.1087	S.D.(M) =	.1097
SUM X =	75.0000	SUM X2 =	141.0000
SKEWNESS =	5.0581 (P = .0000)		
KURTOSIS =	3.5821 (P = .0006)		
N VALID SCORES =	51.		

RAW SCORE	FREQUENCY	PERCENTAGE	PERCENTILE	STANDARD
1.0000	34	67	33	44
2.0000	12	24	78	57
3.0000	3	6	93	70
4.0000	2	4	98	83

students are still working on courses one or two semesters in arrears. When this cumulative report shows their work as complete, then the appropriate grade change can be cleared with the registrar.

Periodically a different kind of printout is prepared which indicates the entire set of competencies accomplished by students across all courses. This is called the profile report (See Exhibit #4, p. 50). Since the information on this report comes from the same computer file as above, the information is the same but it is in a different order. It should be noted that the biographical information appears on the profile report but not the weekly or monthly progress reports. The profile report serves several purposes in the system described here. First, at the beginning of a semester a profile shows what modules have already been completed by the student. Therefore, an individual contract can be filled out which would not require repeating any of these modules. Also at the end of a semester, a student can see a cumulative progress report for all of his work. One of the major motivations for this profile report is demonstrated by its use as a transcript. When a student has finished his degree or certification at the university, a complete record of his accomplishments, as far as competencies within the program are concerned, is available. For example, a future employer might want to know exactly to which forms of instruction a student has been exposed. The traditional transcript only shows courses and grades. Without a more specific course description, no one knows much about the candidate. Therefore, a new form of transcript that includes the detailed information referred to above would be useful.

Several types of summary reports have been produced, usually by semester or by year. These reports are used to revise modules, evaluate room utilization, predict future manpower needs, and establish overall program evaluation. With this information available, there is a large potential for summary statistical analysis. One way in which this analysis has been accomplished is through the use of a program available at the computation center (See Exhibit #5, p. 51). The following are some of the other reports that have been produced:

1) Number of students completing individual modules
2) Number of modules completed by different breakdowns
3) Average hours per student for completion of each module
4) Analysis of students' reactions to modules (Post Module Inventory Form)
5) Cumulative record of laboratory usage

Adaptation and Utilization

As may be surmised by the reader, another institution's adoption of the total information system described in this paper is probably neither feasible nor desirable. No doubt some of the information provided by the system would not be desired at another site. On the other hand, it is equally likely that information not routinely provided by this system might be needed or desired at another location. The point is that adaptation to local needs is always necessary. Hopefully the reader has found the overall discussion of the system useful in anticipating problems and identifying solutions relative to local needs.

While transfer of the entire system is probably not desirable, the authors feel that the subsystem related to profiling and tracking students (SISP) is transportable to any teacher education institution involved with CBTE provided that appropriate previous adaptations are made. The SISP includes several programs written in COBOL, documentation for the systems personnel in charge at the computer site, and documentation for the systems personnel in charge of the logistics at the base of operation. Included in the package are flow charts of all operations involved, computer specifications, card and print layouts, deck structures for implementation, test decks, and exemplary outputs. All that is required to load and run the programs contained in the SISP are computer facilities comparable to the CDC 3000 series or the IBM 360. The standard COBOL programming used is available on machines of this size. The necessary peripheral equipment includes one card reader, two tape drives, and one disk drive. Complete information concerning costs of purchasing parts of SISP, as well as consultative services available, may be obtained by writing to the authors.

A few final words concerning adaptation and utilization seem appropriate whether the reader intends to design his own system from scratch or whether he intends to design parts of it and utilize subsystems (such as SISP) available from other institutions. First, it is a good idea to make the system flexible enough to insure its usefulness in the future. One should not get locked into a system that will only serve a small number of students in a tightly controlled pilot program. Second, the more people that can be involved in the design of the system the better because more planning input will enhance the likelihood that the resulting system will simultaneously serve many different needs. While two or three people may actually carry the primary responsibility for system design, a closed atmosphere during the initial stages should definitely be avoided. Another item worthy of emphasis here is adequate documentation. Early stages of development may necessitate frequent changes; however, every step should be thoroughly documented both in a systems or technical language and in a logistical or nontechnical frame of reference. Failure to document thoroughly for the sake of expediency should not be allowed. Finally, the system should be designed so that it is easy to maintain by relatively nontechnically trained personnel. It is always wise to avoid having a dependence on any one person; therefore, insofar as possible, personnel should be trained so that they can serve as backups for each other in the event of any emergency. The authors have had firsthand experience with all the problems and adaptations described in this paragraph, and, on the basis of this experience, believe that advance consideration of these factors will make any adaptation and utilization of an information system more effective.

Future Applications

The approach to profiling and tracking students, which has been described throughout this paper, represents our efforts to solve some very real needs at a specific point in time. The design of SISP included as much generality as was possible under the normal constraints of time, money, computer size, and talent. There are, however, several avenues which provide further expansion and usefulness of the overall system. The

system described here is definitely more sophisticated than the paper and pencil techniques of the past. The question is: where do we go from here?

Instruction

Computer utilization in the system at present has been restricted primarily to that of sophisticated bookkeeping. However, there are many other possibilities such as Computer Assisted Instruction (CAI). Due to costs and hardware problems, there is less talk of CAI now than there was five years ago. Nevertheless, there are ways of taking advantage of the computer which do not require full-blown implementation of CAI. For example, a certain amount of the posttesting could take place in a computer interactive environment. That is to say, if terminals, which were connected to the computer, were available where students were working, then they could sit at a typewriter or television screen and read and react to questions and problems. This information could then be stored for later evaluation. The next step in increasing sophistication is to have the computer do the evaluation and supply feedback to whoever is concerned. A further refinement allows for the results of the evaluation to immediately be placed onto the computer file so that it would appear on the next report. These options are being explored with respect to the overall system at U.T. El Paso.

Another useful instructional purpose to be served by the expansion of the system described herein has to do with information systems which are available to students. Selected annotated bibliographies of books, tapes, and demonstrations which are available on campus can be stored and recalled by students at any time. The advantage of computers in this area is that additions and deletions are easier to perform. Instructors could have these bibliographies built for their particular courses and any amount of cross-referencing would be possible.

Individualized instruction can be enhanced through the use of computer systems. Students could build or be assigned individual contracts which are placed on the computer file and, as students progress through the competencies, the reports forthcoming would not only indicate what was completed but also what was left to be done or what was next in the sequence. Scope and sequencing, which have been a difficult task for those involved in individualizing instruction, would be considerably easier with some computer assistance.

Management

In addition to the possibilities mentioned under instruction, many additional applications are possible in the area of management. For example, through relatively minor program changes and adjustments in the input called for on the Student Information Form, one could develop the capability to generate the types of reports frequently required by state, regional, and national accrediting agencies. This one modification could save countless hours of manual record keeping in this area alone.

Another possibility in the future relates to faculty loads and allocation of resources to various programs. One of the problems frequently encountered in CBTE programs is the difficulty in making fair and equal

assignments to staff. The old four-course approach just does not work very well when faculty are engaged in individualized types of instruction, so much a part of CBTE programs. By close examination of student profiles and tracking data, one could better determine which components of the program require more faculty time than others. Assignments could then be made on the basis of student needs and not tradition.

The coordination of field experience assignments is another major area that can benefit from utilization of information systems capabilities. With CBTE interns going out into the field earlier and more frequently, it becomes even more necessary to maintain a cumulative up-to-date record of the experiences they have completed as well as the supervision required for the completion. Without this kind of data, the public schools will find themselves in the same position as the university in terms of faculty assignments.

Research and Evaluation

The potential in the area of research and evaluation has only recently begun to be recognized. In this regard, information generated through the use of a comprehensive information system opens up many possibilities. One criticism of CBTE has been its lack of a sound research base. For example, the question of which kind of students do best with which kinds of learning alternatives could be explored by comparing personality profiles with competency profiles and tracking information. Furthermore, if the personality profiles were obtained at the outset of the program, the effects of the program, in terms of change, could be measured. The types of information gathered periodically would also be useful in terms of student advisement as well as program revision and development. Another possibility in this regard would be to compare the relative effectiveness of various types of instructors (in terms of profile data) with different types of students. The resulting information could be used in trying to match instructors and students for maximum student learning experiences.

Perhaps one of the most promising areas related to the use of information systems is that of program evaluation. It is possible to build into a system the capability to determine cost effectiveness of the various elements. This can be done in terms of a number of elements such as student and faculty time, materials and space usage, cost comparisons between various program objectives, and cost benefits of the information system itself including its various subsystems.

Finally, comparisons of programs at different institutions would be simpler if sufficient comparable data were available. Research problems could be attacked on a broad-scale basis through the cooperative efforts of a network of institutions using comprehensive information systems.

The ideas and suggestions mentioned in this section are not proposed as the only future applications of computerized information systems. Rather, they are meant to illustrate some of the potential for such an approach. The SISP subsystem described does an effective job of providing sophisticated profiling and tracking information on students involved in the program, but it is not a total information system. It is only when the package utilized for the purpose of providing profiling and tracking information is truly a

subsystem of a larger and more comprehensive information system that the benefits, both to students and program development specialists, will begin to flow in a systemic manner. When all of the parts or subsystems are fitted together in a logical manner, then their individual contributions are multiplied immeasurably through the resultant interaction. In conclusio it seems logical to assume that the "profiles" and "track records" of students are bound to improve when they are involved in a program which systematically makes use of data generated by a comprehensive information system; that, after all, is the main justification for the entire process.

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